RESTRICTED SERIAL Nº 871

OPERATING MANUAL

FOR

NAVY MODEL ASB-5 AIRCRAFT RADAR EQUIPMENT

Manufactured for
NAVY DEPARTMENT
BUREAU OF SHIPS

By
BENDIX RADIO
DIVISION OF BENDIX AVIATION CORPORATION
Towson, Maryland

Contract NXs-3904

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This instruction book is furnished for the information of commissioned, warranted, enlisted, and civilian personnel of the Navy whose duties involve design, instruction, operation, and installation of Radar Equipment. The word "RESTRICTED" as applied to this instruction book signifies that this instruction book is to be read only by the above personnel, and the contents of it should not be made known to persons not connected with the Navy.

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WARNING

OPERATION OF THIS EQUIPMENT INVOLVES THE USE OF HIGH VOLTAGES WHICH ARE DANGEROUS TO LIFE. OPERATING PERSONNEL MUST AT ALL TIMES OBSERVE ALL SAFETY REGULATIONS. DO NOT CHANGE TUBES OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH HIGH VOLTAGE SUPPLY ON. DO NOT DEPEND UPON DOOR SWITCHES OR INTERLOCKS FOR PROTECTION BUT ALWAYS SHUT DOWN MOTOR GENERATORS OR OTHER POWER EQUIPMENT. UNDER CERTAIN CONDITIONS, DANGEROUS POTENTIALS MAY EXIST IN CIRCUITS WITH POWER CONTROLS IN THE OFF-POSITION, DUE TO CHARGES RETAINED BY CAPACITORS, ETC. TO AVOID CASUALTIES, ALWAYS DISCHARGE AND GROUND CIRCUITS PRIOR TO TOUCHING THEM.

THE ATTENTION OF OFFICERS AND OPERATING PERSONNEL IS DIRECTED TO BUREAU OF ENGINEERING CIRCULAR LETTER NO. 5*a* OF 3 OCTOBER, 1934, OR SUBSEQUENT REVISIONS THEREOF, ON THE SUBJECT OF "RADIO-SAFETY PRECAUTIONS TO BE OBSERVED".

ELECTRIC SHOCK
FIRST-AID TREATMENT

Safety First Regard electrical apparatus generally, and especially all current-carrying parts, as dangerous, irrespective of voltage. Exercise great care in handling, and avoid broad contacts such as are made by standing on a metal deck or in water.

Dangerous contact may result through lessened resistance when the skin and clothing are wet with perspiration. Contact with damp metal surfaces—decks, bulkheads, guns, machinery—may allow the current to ground through the moist skin and body.

Electric shock is due to current passing through the body—current actually passing—irrespective of the voltage. A pressure as low as 110 volts has caused death. Current passing through the body in the region of the heart is especially dangerous. In using electric breast drills avoid the possibility of a ground.

Usually electric shock does not kill instantly. Life can often be saved even though breathing has stopped.

I. Free the Victim from the Circuit Immediately

Use a dry nonconductor (rubber gloves, clothing, rope, board) to move either the victim or the wire. Beware of using metal or moist material.

Shut off the current.

If necessary to cut a live wire, use an ax or hatchet with a dry wooden handle; turn your face away from the electrical flash.

II. Attend Instantly to the Victim's Breathing

Begin resuscitation at once on the spot. Do not stop to loosen clothing; every moment counts.

Resuscitation by the Prone Pressure Method of Artificial Respiration

Gas Asphyxiation ***Electric Shock*** ***Drowning***

Waste no time. When the patient is removed from the water, gas, smoke, or electric contact, get to work at once with your own hands. Send for the medical officer or nearest physician.

No reliance should be placed upon any special mechanical apparatus, as it is frequently out of order and often is not available when most needed. The patient's mouth should be cleared of any obstruction such as chewing gum or tobacco, false teeth, or mucus, so that there is no interference with the entrance and escape of air.

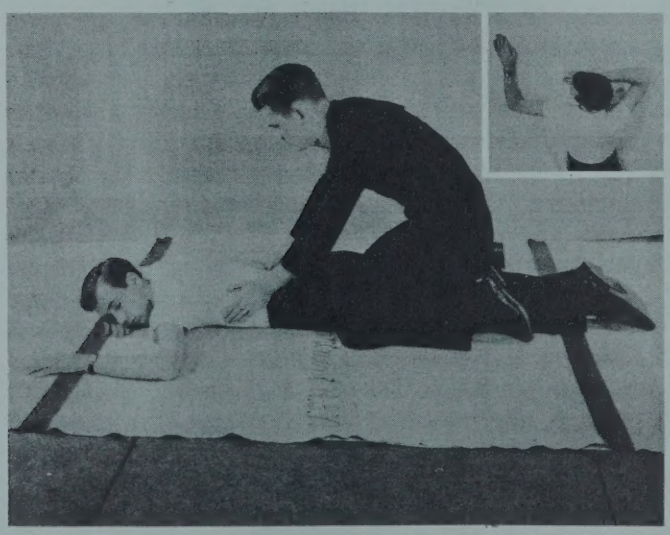

Figure 1

Position

1. Lay the patient on his belly, one arm extended directly overhead, the other arm bent at elbow and with the face turned outward and resting on hand or forearm, so that the nose and mouth are free for breathing. (See Insert Fig. 1.)

2. Kneel straddling the patient's thighs with your knees placed at such a distance from the hip bones as will allow you to assume the position shown in Figure 1.

Place the palms of the hands on the small of the back with fingers resting on the ribs, the little finger just touching the lowest rib, with the thumb and fingers in a natural position, and the tips of the fingers just out of sight. (See Fig. 1.)

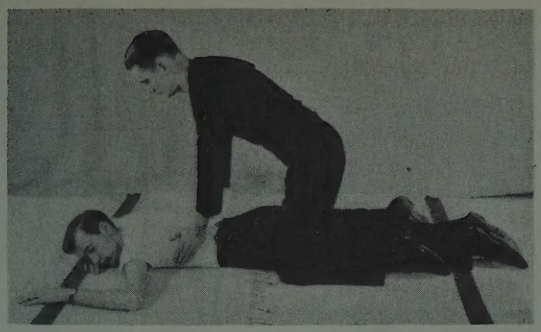

Figure 2

First Movement

3. With arms held straight, swing forward slowly, so that the weight of your body is gradually brought to bear upon the patient. The shoulder should be directly over the heel of the hand at the end of the forward swing. (See Fig. 2.) Do not bend your elbows. This operation should take about two seconds.

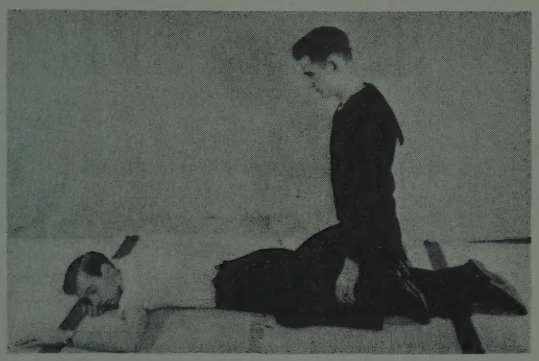

Figure 3

Second Movement

4. Now immediately swing backward, so as to remove the pressure completely. (See Fig. 3.)

5. After two seconds, swing forward again. Thus repeat deliberately twelve to fifteen times a minute the double movement of compression and release, a complete respiration in four or five seconds.

6. Continue artificial respiration without interruption until natural breathing is restored. Do not get discouraged at the slow results that sometimes happen when resuscitating the apparently drowned. Efforts often have to be continued a long time before signs of life are apparent. Do not discontinue the efforts until certain that all chance is lost. Sometimes, even after several hours' work, recovery takes place.

7. As soon as this artificial respiration has been started and while it is being continued, an assistant should loosen any tight clothing about the patient's neck, chest, or waist. TO KEEP THE PATIENT WARM DURING ARTIFICIAL RESPIRATION IS MOST IMPORTANT AND IT MAY BE NECESSARY TO COVER HIM WITH BLANKETS AND WORK THROUGH THEM, AS WELL AS TO APPLY HOT-WATER BOTTLES, HOT BRICKS, ETC. Do not give any liquids whatever by mouth until the patient is fully conscious.

8. To avoid strain on the heart when the patient revives, he should be kept lying down and not allowed to stand or sit up. If the doctor has not arrived by the time the patient has revived, he should be given some stimulant, such as one teaspoonful of aromatic spirits of ammonia in a small glass of water or a hot drink of coffee or tea, etc. Continue to keep the patient warm and at rest.

9. Resuscitation should be carried on at the nearest possible point to where the patient received his injuries. As a general rule he should not be moved from this point until he is breathing normally of his own volition and then moved only in a lying position. Should it be necessary, due to extreme weather conditions, etc., to move the patient before he is breathing normally, resuscitation should be carried on during the time that he is being moved.

10. A brief return of natural respiration is not a certain indication for stopping the resuscitation. Not infrequently the patient, after a temporary recovery of respiration, stops breathing again. The patient must be watched, and if natural breathing stops, artificial respiration should be resumed at once.

11. In carrying out resuscitation it may be necessary to change the operator. This change must be made without losing the rhythm of respiration. The relief operator should kneel behind the one giving the artificial respiration and at the end of the movement, the operator crawls forward while the relief takes his place. By this procedure no confusion results at the time of change of operator, and a regular rhythm is kept up.

PRACTICE IN THE PERFORMANCE OF ARTIFICIAL RESPIRATION ON A VOLUNTEER SUBJECT SHOULD BE OBTAINED BY EVERYONE

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1	Type CRR-14AAG Antenna Switching Unit, Outline and Mounting Dimensions	L73728
2	Type CQW-20ABV Rectifier Power Unit, Outline and Mounting Dimensions	L73746
3	Type CQC-23ACP Power Control Unit, Outline and Mounting Dimensions	L73813
4	Type CQW-46ABO Aircraft Radar Receiver, Outline and Mounting Dimensions	L73748
5	Type CRR-52ABL Aircraft Radar Transmitter, Outline and Mounting Dimensions	N91254
6	Type CQC-55ACB Indicator, Outline and Mounting Dimensions	L73747
7	Type CRB-62AAV Junction Box, Outline and Mounting Dimensions	C59533
8	Model ASB-5 Aircraft Radar Equipment, Typical Cabling Diagram	N91434
9	Cable # 1, Assembly Drawing	AC59202
10	Cable # 2, Assembly Drawing	AC59203
11	Cable # 3, Assembly Drawing	AC59264
12	Cable # 4, Assembly Drawing	AC59200
13	Cable # 5, Assembly Drawing	AC59201
14	Cable # 6, Assembly Drawing	AC59215
15	Cables # 7, # 8, # 9, and # 10, Assembly Drawing	AC59214
16	Cables # 11, # 12, # 13, and # 14, Assembly Drawing	AL73624
17	Flexible Tuning Shaft, Assembly Drawing	AA109252
18	Complete Remote Tuning Control, Outline and Mounting Dimensions	A109572
19	Cable Connectors, Outline Dimensions	C60111

SECTION I
GENERAL DESCRIPTION

1.01-GENERAL—The Navy Model ASB-5 Aircraft Radar Equipment is designed for use in aircraft. The equipment operates from a 115-volt, 600–1400 cycle, single-phase power supply which is not supplied as a part of the Model ASB-5 Aircraft Radar Equipment.

1.02-LIST OF COMPONENTS—The Navy Model ASB-5 Aircraft Radar Equipment consists of the following major units and accessories:

Major Units

Quan.	Navy Type Number	Description	Outline Dwg.		Bendix Ass'y Dwg. No.	Wt., Lbs.
			Fig. No.	Bendix Dwg. No.		
1	CRR-14AAG	Antenna Switching Unit, including shock-mount	1	L73728	AR95759-1	13.75
1	CQW-20ABV	Rectifier Power Unit, including shock-mount	2	L73746	AL73829-1	16.0
1	CQC-23ACP	Power Control Unit	3	L73813	AL73783-1	3.7
1	CQW-46ABO	Aircraft Radar Receiver, including shock-mount	4	L73748	AL73827-1	10.8
1	CRR-52ABL	Aircraft Radar Transmitter, including shockmount	5	N91254	AR95775-1	26.3
1	CQC-55ACB	Indicator, including shockmount and light shield	6	L73747	AL73828-1	21.8

Accessories

Quan.	Navy Type Number	Description	Outline Dwg.		Bendix Ass'y Dwg. No.	Wt., Lbs.	
			Fig. No.	Bendix Dwg. No.		Cable, lbs/ft	Fittings, Complete
1		*Set of cables and plugs for fabricating the following cables:					
1		Cable #1 (Power Source—Power Control Unit)	9		AC59202	0.182	0.26
1		Cable #2 (Power Control Unit—Rectifier Power Unit)	10		AC59203	0.182	0.46
1		Cable #3 (Rectifier Power Unit—Aircraft Radar Transmitter)	11		AC59264	0.094	0.53
1		Cable #4 (Antenna Switching Unit—Rectifier Power Unit)	12		AC59200	0.79	0.25
1		Cable #5 (Rectifier Power Unit—Aircraft Radar Receiver)	13		AC59201	0.182	0.56

Accessories (*continued*)

Quan.	Navy Type Number	Description	Outline Dwg.		Bendix Ass'y Dwg. No.	Wt., Lbs	
			Fig. No.	Bendix Dwg. No.		Cable, lbs/ft	Fittings, Complete
1		Cable #6 (Rectifier Power Unit—Indicator)	14		AC59215	0.182	0.54
1		Cable #7 (Indicator—Aircraft Radar Transmitter)	15		AC59214-1	0.071	0.094
1		Cable #8 (Antenna Switching Unit—Aircraft Radar Receiver)	15		AC59214-2	0.071	0.094
1		Cable #9 (Antenna Switching Unit—Indicator, Port)	15		AC59214-4	0.071	0.094
1		Cable #10 (Antenna Switching Unit—Indicator, Starboard)	15		AC59214-3	0.071	0.094
1		Cable #11 (Aircraft Radar Transmitter—Antenna Switching Unit)	16		AL73624-3	0.112	0.250
1		Cable #12 (Antenna Switching Unit—Aircraft Radar Receiver)	16		AL73624-4	0.112	0.250
1		Cable #13 (Antenna Switching Unit—Port Antenna)	16		AL73624-1	0.112	0.125
1		Cable #14 (Antenna Switching Unit—Stbd. Antenna)	16		AL73624-2	0.112	0.125
						Wt., Lbs	
1		†Mechanical Tuning Shaft, complete with fittings	17		AA109252	0.11 lbs/ft	
1		†Remote Tuner Assembly, complete with mounting brackets		A109572	AA109078	0.2	
1	CRB-62AAV	‡Junction Box	7	C59533	AC59898	0.8	

* Plugs and fittings for each end of cables 1 to 6, inclusive, are placed in separate cloth bags. The eight coaxial plugs for cables 7 to 10, inclusive, are supplied in another bag, and six coaxial plugs for cables 11 to 14 are supplied in a third bag. These separate bags are in turn placed in a cardboard carton which contains all plugs and fittings necessary for a complete installation. Cable is supplied in bulk, on reels. Cables are assembled at the time of installation, due to the varied problems encountered in each installation.

† One remote tuner assembly, and fittings for one flexible tuning shaft are supplied with each 2 equipments. The flexible tuning shaft is supplied in bulk, in 20-foot lengths. End fittings are assembled on shaft at time of installation

‡ One Navy Type CRB-62AAV Junction Box is supplied with each 10 equipments.

1.03-ADDITIONAL EQUIPMENT REQUIRED—The following additional equipment (not supplied under the contract) will be required for the satisfactory operation of the Navy Model ASB-5 Aircraft Radar Equipment.

1—Antenna System

1—Power Source, 115 volts, 600–1400 cycles, single phase

Instructions for the installation and use of this additional equipment will be issued under separate cover by the Navy Department—Bureau of Aeronautics.

SECTION II

INSTALLATION

2.01-GENERAL—Figure 8 illustrates a typical installation of the Model ASB-5 Aircraft Radar Equipment; however, due to the flexibility of design of the equipment, considerable variation may occur in various installations. All major units except the Type CQC-23ACP Power Control Unit are supplied with Lord shockmounts which are designed for permanent attachment to the aircraft structure. The Power Control Unit, which does not require shockmounting, is equipped with a mounting base which is to be permanently attached to the aircraft structure at the time of installation. Each unit is designed for easy removal from its mounting base.

Outline and mounting dimensions, weights, and specific instructions concerning the installation of the six major units are given in Figures 1 to 6, bound at the rear of this book.

When installing the equipment, care should be taken to ascertain that sufficient clearance is allowed, as indicated on the outline drawings, to permit removal of the units, plugs, covers, etc., and to permit the units to vibrate freely on their shockmounts without striking any solid objects. Sufficient slack should be left in the interconnecting cables to allow freedom of vibration for all units.

2.02-LOCATION OF UNITS—Due to the fact that the length of the interconnecting cables is a somewhat critical factor in the operation of the equipment, the relative locations of the separate units, with respect to each other, is of great importance.

Locations should be such as to avoid excessive lengths of interconnecting cables, in order to minimize voltage drops in the power cables, capacitance loading of the video circuits, and r-f power losses in the radio frequency circuits. The interconnecting cables between the Type CRR-14AAG Antenna Switching Unit and the two antennas must be of equal length and as short as possible.

By locating the Rectifier Power Unit centrally, with respect to the other units, and by placing the Antenna Switching Unit between the Aircraft Radar Receiver and the Aircraft Radar Transmitter and as near as possible to the Indicator, the lengths and congestion of the interconnecting cables may be materially reduced.

The Power Control Unit, the Indicator, and the Remote Tuning Control Crank should be arranged as close together as possible for greatest convenience to the operator. If it is not desirable to use the Remote Tuning Control Crank in the installation, the front panel of the receiver must also be easily accessible to the operator for receiver tuning. The remaining units do not normally require attention during operation but it is desirable that they be located where space is available for servicing them under actual operating conditions, if necessary. It will also be helpful to arrange the units in such a way that the maintenance man may watch the indicator screen while adjusting any of the units.

The location of the individual units is also governed somewhat by the amount of air circulation around the units and the ambient temperature. Although the Model ASB-5 Aircraft Radar Equipment is designed to operate continuously in an ambient temperature as high as 50 degrees Centigrade (122 degrees Fahrenheit), the units should be located with due consideration given to the amount of heat to be dissipated around each unit. The watt-dissipation in each unit is shown in the following table:

Aircraft Radar Transmitter	218 watts (approx.)
Rectifier Power Unit	40 watts (approx.)
Aircraft Radar Receiver	53 watts (approx.)
Indicator	41 watts (approx.)
Antenna Switching Unit	14 watts (approx.)
Power Control Unit	Negligible
Total	366 watts (approx.)

2.03-TYPE CQC-23ACP POWER CONTROL UNIT—The Power Control Unit should be located within easy reach and visibility of the operator stationed at the Indicator in order to facilitate control of the operating voltage and power supply to the equipment. (The operating voltage is indicated by the voltmeter located on the control panel.) This location also provides for easy replacement of fuses. The power control unit may be mounted in a vertical position or at any desired angle. The unit is provided with a flat rear mounting base with 4 holes drilled at the side for mounting to the selected surface by means of four no. 6 machine screws. All necessary outline and mounting dimensions are shown on Figure 3.

2.04-TYPE CQC-55ACB INDICATOR—The Indicator should be so located that the front panel is either vertical or tilted, for convenience of the

operator in viewing the indicator screen. As well as being located favorably with respect to the other units, the Indicator should preferably be located in a compartment where the lighting is subdued.

Holes are provided on both sides of the Indicator for mounting the Receiver remote tuning drive bracket assembly on the side which is most convenient to the particular installation involved. If preferred, or if space is not available for mounting the bracket in such a manner, the remote tuning drive bracket may be attached elsewhere within easy reach of the operator. Figure 6 contains all necessary outline and mounting dimensions for the Type CQC-55ACB Indicator.

After selecting the proper location for the Indicator, loosen the two thumb screws holding the unit to its shockmounting base, and remove the unit from the base. Drill mounting holes in the proper location, as shown in the drilling plan of Figure 6, and mount the base to the aircraft structure by means of sixteen no. 8 machine screws, four through each foot and the mounting surface. Carefully bend each of the four grounding straps located at the corners of the mounting base into a U-shaped loop, and fasten the loose end of each loop firmly under the nearest one of the mounting screws in each foot.

In order to facilitate the use of a screwdriver in mounting the Indicator, it is possible to remove the Lord mounts from the mounting base frame by removing the two machine screws which are located in each corner of the mounting frame and are threaded into the Lord mount. If this is done, the Lord mounts should each be mounted to the aircraft structure, leaving out the screw through the inside corner of each mount so that the grounding straps may be fastened later. After all four mounts are attached to the aircraft structure, attach the mounting base frame to the mounts and replace the two screws in each corner of the base. (Care must be exercised in alignment of the Lord mounts in order to avoid additional stresses on the mounts which might nullify their shock absorbing properties.) Each of the four grounding straps located on the under side of the mounting base frame should be bent into a U-shape and fastened to the inside corner of the mounting plate of each Lord mount by means of the mounting screw which was previously omitted. Holes have been drilled in the mounting base frame directly over the inside mounting screw of each Lord mount, in order to facilitate use of a screwdriver on this screw.

Make sure that a good electrical ground contact is established to the aircraft structure at each foot in order to promote safety and minimize interference with other radio equipment in the aircraft.

After the mounting base is securely mounted, the Indicator may be slid into position and locked to the base.

2.05-OTHER MAJOR UNITS—Mounting of the Antenna Switching Unit, the Rectifier Power Unit, the Aircraft Radar Receiver, and the Aircraft Radar Transmitter is accomplished in the same manner as described in section 2.04 for the Indicator, except that no. 6 machine screws are required for mounting the Aircraft Radar Receiver, the Rectifier Power Unit, and the Antenna Switching Unit, and the Lord mounts are not detachable from the base of the Antenna Switching Unit or the Aircraft Radar Transmitter. Holes are drilled through the bases or the shape of the base members is such as to provide accessibility to the mounting screws in the two latter-mentioned units. The general recommendations, mentioned in section 2.02, regarding the relative locations of these units should be followed insofar as possible during the installation. Space should be provided around each unit for air circulation in order to insure adequate cooling. Ascertain that the air vent at the left side of the transmitter is clear of all obstructions so that the heated air expelled from the transmitter may escape without striking another unit. Mounting and outline dimensions of these units are shown in Figures 1, 2, 4, and 5.

2.06-INTERCONNECTING CABLES—After the various units have been installed, or their locations selected, the necessary lengths of interconnecting cables can be determined. The cable numbers and connections between the units, antennas and power source are shown in the cabling diagram of Figure 8. The following table of cable color coding shows the number assigned to each cable, in order to provide an easy reference for the cables, as well as the function and type of each cable and its color coding. All video and RF cables are color coded according to the equipment which they interconnect. This color coding appears on the plugs at each end of the cable and on the designation plate at the proper receptacle on the units. The power cables are not color coded.

YELLOW indicates cables to the Aircraft Radar Transmitter

BLUE indicates cables to the Aircraft Radar Receiver

RED indicates port cables to the Antenna Switching Unit

GREEN indicates starboard cables to the Antenna Switching Unit

In determining the actual lengths of the cables, consideration must be given to the following requirements:

(a) Sharp bends must be avoided. The minimum bending radius for each cable is specified on its assembly drawing at the rear of this book.

(b) The cables must be of sufficient length to provide for removal of the connectors from the units, to permit dismounting of the units for servicing during operation, and to permit freedom of vibration of the units on their shockmounts.

(c) Cables 9 and 10 should be of approximately equal length.

(d) The sum of the lengths of cables 8 and 9, or 8 and 10, should not exceed 20 feet.

Cable Color Coding

Cable Number	Units Connected by Cable	Color Coding
	Power Cables	
1	Power Source—Power Control Unit	None
2	Rectifier Power Unit—Power Control Unit	None
3	Rectifier Power Unit—Aircraft Radar Transmitter	None
4	Rectifier Power Unit—Antenna Switching Unit	None
5	Rectifier Power Unit—Aircraft Radar Receiver	None
6	Rectifier Power Unit—Indicator	None
	Video Cables	
7	Aircraft Radar Transmitter—Indicator	Yellow
8	Aircraft Radar Receiver—Antenna Switching Unit	Blue
9	Antenna Switching Unit—Indicator (Port)	Red
10	Antenna Switching Unit—Indicator (Stbd.)	Green
	RF Cables	
11	Aircraft Radar Transmitter—Antenna Switching Unit	Yellow
12	Antenna Switching Unit—Aircraft Radar Receiver	Blue
13	Antenna Switching Unit—Port Antenna	Red
14	Antenna Switching Unit—Stbd. Antenna	Green

(e) Cables 11 and 12 are somewhat critical as to length. See sections 3.05 and 3.06.
(f) Cables 13 and 14 must be of equal length.
(g) All cables should be made as short as possible after meeting all the foregoing requirements.

All power cables are of the cotton braid covered, shielded, multi-conductor type. All RF and video cables are single conductor, solid dielectric, coaxial cables.

2.07-FABRICATION OF CABLES—The detailed construction and assembly information for the fourteen interconnecting cables is given in Figures 9 to 16, inclusive. The necessary material for fabrication of the cables is supplied in bulk; the cable being supplied on reels and the cable plug and end fittings for each end of the cables 1 to 6, inclusive, being supplied in a separate bag. The eight coaxial plugs for cables 7 to 10, inclusive, are placed in a second bag, and the six coaxial plugs for cables 11 to 14, inclusive, are placed in a third bag. The separate bags are placed in a cardboard carton which contains all of the cable plugs and end fittings necessary for a complete installation.

The following list shows the cable material supplied with each equipment:

Cable (Supplied in Bulk on Reels)

For Cable No.	Description
1, 2, 5, 6	6-conductor, Internal shield, Navy Type CPW-62041
3	4-conductor, Internal shield, Navy Type CPW-62042
4	2-conductor, Internal shield, Navy Type CPW-62043
7, 8, 9, 10	Coaxial, Single-conductor, 7/30 stranded, Internal shield, Amphenol Type 21B-255-7/30-XV
11, 12, 13, 14	Coaxial, Single-conductor, 7-strand, Navy Type CASSF-50-1

Plugs and Fittings

For Cable	Description	Quantity
#1	Plug, 6-contact, Straight, Female, AN3106-22-5S	1
Power Control Unit end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #5	5/8"
	Tubing, Black, Flexible, #8	1¼"
	Tubing, Black, Flexible, #7	5/8"
	Tubing, Black, Flexible, #9	1¼"
	Wire, #18, Lenzac	1½"

Plugs and Fittings (*continued*)

For Cable	Description	Quantity
#2	Plug, 6-contact, Straight, Male, 97-3106-22-5P, Position 2	1
Power Control Unit end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #8	1¼"
	Tubing, Black, Flexible, #7	1¼"
	Tubing, Black, Flexible, #9	1¼"
#2	Plug, 6-contact, Straight, Female, 97-3106-22-5S, Position 2	1
Rectifier Power Unit end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #8	1¼"
	Tubing, Black, Flexible, #7	1¼"
	Tubing, Black, Flexible, #9	1¼"
#3	Plug, 4-contact, Straight, Male, AN-3106-20-4P	1
Rectifier Power Unit end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #8	2½"
#3	Plug, 4-contact, 90°, Female, AN-3108-20-4S	1
Aircraft Radar Transmitter end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #8	2½"
#4	Plug, 2-contact, Straight, Male, AN-3106-16S-4P	1
Rectifier Power Unit end plug assembly	Clamp, AN-3057-8	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #10	¾"
#4	Plug, 2-contact, 90°, Female, AN-3108-16S-4S	1
Antenna Switching Unit end plug assembly	Clamp, AN-3057-8	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #10	¾"
#5	Plug, 6-contact, Straight, Male, AN-3106-22-5P	1
Rectifier Power Unit end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #6	⅝"
	Tubing, Black, Flexible, #7	1¼"

Plugs and Fittings (*continued*)

For Cable	Description	Quantity
	Tubing, Black, Flexible, #8	1¼"
	Tubing, Black, Flexible, #9	⅝"
	Wire, #18, Lenzac	1⅝"
#5	Plug, 6-contact, 90°, Female, AN-3108-22-5S	1
Aircraft Radar Receiver end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #6	⅝"
	Tubing, Black, Flexible, #7	1¼"
	Tubing, Black, Flexible, #8	1¼"
	Tubing, Black, Flexible, #9	⅝"
	Wire, #18, Lenzac	3"
#6	Plug, 6-contact, Straight, Male, AN-3106-22-24P (Formerly designated as 97-3106-22-711P)	1
Rectifier Power Unit end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #6	⅝"
	Tubing, Black, Flexible, #7	1¼"
	Tubing, Black, Flexible, #8	1¼"
	Tubing, Black, Flexible, #9	⅝"
	Wire, #18, Lenzac	1⅝"
#6	Plug, 6-contact, 90°, Female, AN-3108-22-24S (Formerly designated as 97-3108-22-711S)	1
Indicator end plug assembly	Clamp, AN-3057-12	1
	Tubing	1
	"C" Washer	1
	Rubber gasket	1
	Retaining washer	1
	Tubing, Black, Flexible, #6	⅝"
	Tubing, Black, Flexible, #7	1¼"
	Tubing, Black, Flexible, #8	1¼"
	Tubing, Black, Flexible, #9	⅝"
	Wire, #18, Lenzac	3"
#7	Plug, Single-contact, Amphenol Type 80-81	1
Aircraft Radar Transmitter end plug assembly		
#7	Plug, Single-contact, Amphenol Type 80-81	1
Indicator end plug Assembly		
#8	Plug, Single-contact, Amphenol Type 80-81	1
Antenna Switching Unit end plug assembly		
#8	Plug, Single-contact, Amphenol Type 80-81	1
Aircraft Radar Receiver end plug assembly		
#9	Plug, Single-contact, Amphenol Type 80-81	1
Antenna Switching Unit end plug assembly		

Plugs and Fittings (*continued*)

For Cable	Description	Quantity
#9 Indicator end plug assembly	Plug, Single-contact, Amphenol Type 80-81	1
#10 Antenna Switching Unit end plug assembly	Plug, Single-contact, Amphenol Type 80-81	1
#10 Indicator end plug assembly	Plug, Single-contact, Amphenol Type 80-81	1
#11 Antenna Switching Unit end plug assembly	Plug, Single-contact, Special, Amphenol Type 93M Modified	1
#11 Aircraft Radar Transmitter end plug assembly	Plug, Single-contact, Special, Amphenol Type 93M Modified	1
#12 Antenna Switching Unit end plug assembly	Plug, Single-contact, Special, Amphenol Type 93M Modified	1
#12 Aircraft Radar Receiver end plug assembly	Plug, Single-contact, Special, Amphenol Type 93M Modified	1
#13 Antenna Switching Unit end plug assembly	Plug, Single-contact, Special, Amphenol Type 93M Modified	1
#14 Antenna Switching Unit end plug assembly	Plug, Single-contact, Special, Amphenol Type 93M Modified	1

The cable assembly drawings, Figures 9 to 16 give complete instructions for actual fabrication of the cables. However, it is advisable to take certain added precautions in the assembly procedure.

(a) Be sure to place the black flexible tubing over all exposed connections in the plugs.

(b) In attaching right angle connector, be sure to set the plug terminals in the proper position relative to the cable leads before soldering and clamping in order to avoid twisting the cable leads in the plug in attempting to set the position after assembly.

(c) Be sure that the clamp is screwed securely to the plug so that the plug cannot work loose after installation and twist the cable leads in the plug, thus possibly breaking the leads or causing a short.

(d) In assembly of the video and RF cables, do not apply more heat than is absolutely necessary when soldering the cable shield to the sleeve or coil spring, as the dielectric will soften when heated. If the dielectric should soften, care should be exercised to see that the concentricity of the conductor is not disturbed until the dielectric has a chance to harden.

2.08-CABLE TESTING—After the cables have been assembled, they should be tested as follows:

(a) *Continuity*—Check all cables for continuity between corresponding terminals at each end of the cable, and for possible shorts between each terminal and the connector body or shield.

NOTE: Pin C of cable 1, pin F of cable 5, and pin A of cable 6 are ground terminals and should show continuity to the plug shells.

(b) *Breakdown*—At 1000 volts d-c (or 700 volts RMS, 60-cycle), check each terminal, (EXCEPT TERMINAL D ON CABLE 6) to connector body and to all other terminals.

At 5000 volts d-c (or 3500 volts RMS, 60-cycle), check terminal D of cable 6 to connector body and to all other terminals.

2.09-INSTALLATION OF CABLES—When installing the cables, ascertain that the proper end (male or female) of each of the power supply cables is adjacent to each unit, in accordance with the cabling diagram, Figure 8.

BEFORE PLUGGING THE CABLES INTO ANY UNITS, MAKE SURE THAT THE POWER SWITCH ON THE POWER CONTROL UNIT IS IN THE "OFF" POSITION.

Check each cable against the cabling diagram before connecting, and make sure that the color markers on the cables and receptacles on the units agree. Tighten the locking rings on all connectors.

(a) Ground Connections. The chassis bases and dust covers of all units are grounded by the mounting bases or by attached grounding straps to be mounted with shockmounted units, directly to the aircraft structure. In addition, the metal shields on all cables are grounded at each unit.

(b) Antenna Connections. The RF transmission cables (cables 13 and 14) connecting the Antenna Switching Unit to the port and starboard antennas must be of equal length and as short as possible. As the antenna system is not supplied with the Model ASB-5 Aircraft Radar Equipment, instructions for its installation and connection of the transmission lines to the antennas will be issued under separate cover by the Navy Department—Bureau of Aeronautics.

(c) Power Supply Connections. The power input cable (Cable 1) connecting from the Power Control Unit to the power source provides for the following connections:

Terminals A and D, which are shorted by the power switch in its second and third positions, may be used to control a starting relay for the power source.

Terminals B and E connect to the 600–1400 cycle supply.

Terminals B and F may be used for automatic voltage control, as the voltage between them is the actual operating voltage of the equipment.

Terminal C provides a ground connection.

As the power source is not included with the Model ASB-5 Aircraft Radar Equipment, specific instructions for making the required connections will be issued under separate cover by the Navy Department, Bureau of Aeronautics. In some cases, local adjustment of the operating voltage may not be required, in which case the specific instructions may include information for short-circuiting the voltage compensating switches on the Power Control Unit, thus rendering them ineffective.

2.10-REMOTE TUNING ASSEMBLY—If the Aircraft Radar Receiver is placed in such a location that it is not easily accessible to the operator for tuning, the remote tuning assembly must be used. The remote tuning assembly consists of a flexible tuning shaft, a mounting bracket assembly, and the tuning crank which must be removed from the front panel of the receiver. The complete remote tuning assembly is shown in Figure 18, with outline and mounting dimensions.

One complete set of fittings for the flexible tuning shaft is supplied with each two equipments. Two feet of flexible tuning shaft and housing is supplied per equipment; however, this material is shipped on reels in 20-foot lengths. Figure 17 shows the assembly of the flexible tuning shaft.

The remote tuner mounting bracket is normally mounted on the right side of the Indicator, however, provision has been made for mounting it on the left side of the Indicator. If both of these locations are inconvenient, the bracket may be mounted elsewhere within easy reach of the operator.

SECTION III

PRELIMINARY ADJUSTMENTS

3.01-GENERAL—After the equipment has been installed in accordance with the instructions given in section II, it is necessary to make certain adjustments preliminary to placing the equipment in actual service.

The preliminary adjustments should not be undertaken until thoroughly familiarizing oneself with the operation of the equipment, as described in section IV.

NOTE: THE MODEL ASB-5 AIRCRAFT RADAR EQUIPMENT SHOULD NOT BE OPERATED AT A VOLTAGE BELOW 110 VOLTS FOR ANY LENGTH OF TIME. THE PROTECTIVE CIRCUITS IN THE TRANSMITTER WILL HAVE A MUCH LONGER LIFE IF THEY ARE NOT OVERLOADED EXCESSIVELY.

Since the voltage of some power sources may be reduced considerably at a reduced aircraft engine speed, the operator should become engine-speed conscious so that whenever a reduction occurs, he will watch the voltmeter and be prepared to switch off the equipment when the power supply voltage falls below 110 volts. If the voltage drops below 100 volts, it will be apparent from the fact that the Type CQC-55ACB Indicator will fail to indicate properly.

NOTE: THE MODEL ASB-5 AIRCRAFT RADAR EQUIPMENT SHOULD NEVER BE OPERATED AT A VOLTAGE IN EXCESS OF 120 VOLTS. OPERATION AT A VOLTAGE GREATER THAN 120 VOLTS WILL SUBJECT THE ELECTROLYTIC CAPACITOR IN THE RECTIFIER POWER UNIT TO AN EXCESSIVELY HIGH VOLTAGE WHICH MAY SHORTEN ITS LIFE.

WARNING: THE POWER SWITCH ON THE POWER CONTROL UNIT MUST NEVER BE TURNED ON UNLESS ALL UNITS ARE CONNECTED TO THE RECTIFIER POWER UNIT. IF THE POWER IS TURNED ON WITH ANY UNITS DISCONNECTED, THE VOLTAGE MAY RISE SUFFICIENTLY HIGH TO CAUSE THE ELECTROLYTIC CAPACITOR IN THE RECTIFIER POWER UNIT TO BREAK DOWN.

The following preliminary arrangements should be made before proceeding:

(a) A test milliammeter (0–50 ma scale, resistance less than 2 ohms) should be connected to the phone jack marked PLATE CURRENT and located on the front panel of the Aircraft Radar Transmitter.

The sleeve of the plug used for making the connection should be connected to the positive (+) terminal of the meter, and the plug tip should be connected to the negative (−) side of the meter. Do not use a protective fuse in series with the meter as a fuse has a high resistance and will prevent accurate meter readings. The meter protection is placed inside the equipment and the plate current can never rise to 50 milliamperes.

(b) Connect a frequency meter for measurement of the transmitter RF oscillator frequency, in accordance with instructions furnished with the frequency meter.

(c) If the correct lengths of cables 11 and 12 have not been previously determined, the installed cables should be of such lengths as to give the best mechanical installation. Two extra cables of each type should be supplied for test purposes. These extra cables should be of the following lengths:

CABLE 11—One cable $1\frac{3}{4}$ inches longer and one $3\frac{1}{2}$ inches longer than the installed cable.

CABLE 12—One cable $2\frac{1}{2}$ inches longer and one 5 inches longer than the installed cable.

(d) Have calibrator equipment available for calibration of the Indicator.

When the foregoing arrangements have been completed, start the equipment as described in section, 4.02, *except as follows:*

(a) When the power switch is turned to the WAIT 5 SEC. position, immediately note the reading of the test milliammeter, and if it is less than 1.0 ma or more than 2.0 ma, turn the equipment off at once and refer to the maintenance manual before proceeding. If the a-c voltmeter indicates more than 120 volts or less than 110 volts, turn the equipment off at once and consult the maintenance manual for further instructions.

(b) Wait at least 2 minutes in the WAIT 5 SEC. position. If the a-c voltmeter indicates less than 110 volts when the power switch is turned to the ON position, switch off the equipment and refer to the maintenance manual before proceeding.

NOTE: This precaution is of extreme importance when the equipment is operated for the first time after the installation has been completed. The two minute delay exceeds the automatic delay interval mentioned in section 4.02 (d), and, therefore, will insure instantaneous operation of the transmitter when the power switch is turned to ON. A sudden drop in the a-c voltage at this instant indicates trouble which is

likely to cause serious damage if the power is not switched off at once.

3.02-CENTERING OF INDICATOR BEAM—Using the screwdriver adjustments marked H. CENT and V. CENT on the front panel of the indicator, center the base line (vertical trace) accurately with respect to the indicator scale, both horizontally and vertically. The adjustment of the vertical trace should be checked for all positions of the RANGE control.

3.03-ALIGNMENT ADJUSTMENTS—The object of making the alignment adjustments is to provide the maximum overall sensitivity without overloading the transmitter. The relative sensitivity may be checked by observation of a non-saturated signal (See section 3.07), and the degree of transmitter loading is indicated by the d-c test milliammeter reading, which should be watched constantly and should not exceed 10 ma.

3.04-TRANSMITTER TUNING (Refer to Figure 5)—Loosen the thumb nut located on the bottom cylinder on the front panel of the Aircraft Radar Transmitter and push it to the left as far as it will go. . (See control 6 in Figure 5.)

Loosen the locking hex nut located on the slotted stud half way between the elbow ends of the upper and lower cylinders. Unscrew the slotted stud as far as possible. (See control 4 in Figure 5.)

Slide the thumb nut (control 6) on the bottom cylinder to the right until maximum signal strength is shown on the Indicator. Using a screwdriver, turn the slotted stud (control 4) clockwise until a further increase in signal strength is indicated. The plate current should be under 10 milliamperes at maximum signal strength. It will be found that there is one setting of control 4 and control 6 for maximum signal strength, and any movement of control 4 will require a movement of control 6 for proper tuning. Move 4 slightly and then retune 6 until the optimum setting is found for both controls. It is well to remember to retune the Receiver each time a change in Transmitter adjustments is made.

3.05-LENGTH OF CABLE 11 (Aircraft Radar Transmitter to Antenna Switching Unit)—Adjust the length of this line by loosening the clamp at the end of the outer cylinder of the upper sliding unit and pushing the inner cylinder (7 in Figure 5) back to the left as far as it will go. Then pull it out until maximum signal strength is indicated. Maximum sensitivity is indicated by maximum signal strength on some non-saturated signal. (See section 3.07.)

If maximum sensitivity is not reached before the upper cylinder has been moved all of the way to the right or left, substitute the extra cable 11 which is 1¾ inches longer than the installed cable, and again adjust the upper cylinders for maximum signal. If maximum signal is still not obtained, substitute the cable which is 3½ inches longer than the original cable and adjust for maximum signal.

A further adjustment may be obtained by readjusting controls 4, 6, and 7 for the best signal strength. Watch the plate current milliammeter (test meter) to see that the plate current does not exceed 10 milliamperes. If it is apparent that maximum performance is not obtained before the plate current reaches 10 milliamperes when adjusting one of the controls, the screws in all of the slotted holes on the front panel cylinder assembly should be loosened, and the entire assembly moved to the right or left.

WARNING: DO NOT COMPLETELY REMOVE SCREWS OR ATTEMPT TO REMOVE THE ENTIRE CYLINDER ASSEMBLY WITH THE POWER ON, AS EXTREMELY HIGH VOLTAGES ARE USED INSIDE THE TRANSMITTER.

Move the assembly until the plate current drops to 5 or 6 milliamperes, or if the ends of the slots prevent sufficient movement to drop the plate current to this value, then move the assembly as far as it will go and tighten all screws. Again readjust controls 4, 6, and 7 for maximum signal strength. If the plate current still exceeds 10 milliamperes with best adjustments, loosen the screws in the slotted holes previously mentioned and again move the entire cylinder assembly still further in the direction that gives a reduced plate current, unless the movement has previously been carried to the limit. If the limit of movement still does not prevent the plate current from exceeding 10 milliamperes, the maintenance manual should be referred to for further information.

3.06-LENGTH OF CABLE 12 (Antenna Switching Unit to Aircraft Radar Receiver)—A signal indication having maximum range should be selected for this test, using the shortest possible length of cable 12. Set the RECeiver GAIN control to bring the indication on the screen to a desired level below the saturation point of the equipment (saturation results in a flat-topped trace).

Leaving the RECeiver GAIN control set, replace the short cable by each of the two extra cables (2½ and 5 inches longer; see section 3.01), and compare the resulting deflections. Retain the cable which gives the best sensitivity (maximum deflection). Should this sensitivity prove to be inadequate or unsatisfactory, call a maintenance man or refer to the maintenance manual for information regarding adjustments of the Antenna Switching Unit and the Aircraft Radar Receiver.

The power switch should be OFF when switching cables.

3.07-RECEIVER TUNING—Tuning of the receiver is accomplished by means of the tuning crank located at either the Aircraft Radar Receiver or at the remote tuning bracket mounted at or near the Indicator.

Select a signal which does not reach the saturation level (saturation results in a flat-topped trace) and is separated from any other signal

trace which reaches the saturation level. In general, an indication having the maximum possible range should be selected. The RECeiver GAIN control, located on the Indicator, may be used to reduce the response until the signal is below the saturation level.

Tune the receiver for maximum indicated response, again reducing the gain, if necessary, to avoid saturation.

If the receiver does not tune for a maximum indicated response before the crank reaches the stop at either extreme clockwise or counterclockwise position, check the transmitter frequency and correct if necessary, as described in section 3.08. If the receiver still does not tune, with the transmitter set to the correct frequency, consult the maintenance manual for further instructions.

3.08-TRANSMITTER FREQUENCY ADJUSTMENT—Check the Transmitter frequency in accordance with instructions accompanying the frequency meter. The frequency should be within one megacycle of the desired value. If the adjustment required to provide this accuracy does not exceed 2 megacycles, the frequency can be adjusted according to the following procedure:

Remove the #6 four-fluted Bristo setscrew wrench from its coiled spring holder on the front panel of the transmitter. It is located under the lower cylinder. Loosen the setscrews in the upper and lower slotted-shaft bushings (controls 3 and 5, Figure 5).

Notice the small indicating lines at right angles to the screwdriver slots in the ends of the shafts. These lines point to the lines engraved in the ends of the shaft bushings, and the relative positions of the two shaft indicating lines should be the same.

Adjust the frequency by turning these shafts with a screwdriver until maximum response is indicated on the frequency meter, with the transmitter power on and the frequency meter set for the desired operating frequency. The greatest frequency change will be found to occur when the shaft lines are changed from a vertical center position to an almost horizontal position to the left. Each shaft is equipped with a stop to halt rotation to the left before a 90-degree shift from the vertical position is reached. Changing the shaft lines to a position approximately 90 degrees to the right of the vertical position will give a smaller frequency change than an equivalent change to the left of the vertical position. There is also a stop on the right hand position of each shaft.

The highest frequency will be obtained when the lines are in a vertical position in the center of each bushing scale, and the lowest frequency will be obtained when the lines are both pointing to the left as far as the shaft will turn.

Make sure both dial readings correspond when making adjustments.

After turning the shafts 3 and 5 for maximum frequency meter indication, retune the frequency meter for maximum response and check the frequency setting.

If this setting is within ± 1 megacycle of the desired frequency, the bushing setscrews should be firmly tightened and the wrench replaced in its spring holder.

If the desired frequency cannot be reached by the foregoing method, it will be necessary to consult the maintenance manual for further instructions.

At this stage all of the foregoing alignment adjustments (section 3.03) should be repeated in the specified sequence until an absolute maximum of sensitivity, without transmitter overloading, has been obtained. When this condition has been reached, tighten the screws and nuts to retain the correct adjustments of the coaxial sliding lines.

THE RECEIVER MUST BE RETUNED EACH TIME A TRANSMITTER ADJUSTMENT IS MADE.

3.09-INDICATOR CALIBRATION—The Indicator should be calibrated in accordance with the instructions supplied with the calibrator equipment. This adjustment may necessitate a slight readjustment of the vertical or horizontal centering of the trace, as described in section 3.02.

SECTION IV

OPERATION

WARNING: THE MODEL ASB-5 AIRCRAFT RADAR EQUIPMENT SHOULD NOT BE OPERATED AT A VOLTAGE BELOW 110 VOLTS FOR ANY LENGTH OF TIME. SINCE THE VOLTAGE OF SOME POWER SOURCES MAY BE LOWERED CONSIDERABLY AT A REDUCED AIRCRAFT ENGINE SPEED, THE OPERATOR SHOULD BECOME ENGINE-SPEED CONSCIOUS SO THAT, WHENEVER A REDUCTION IN SPEED OCCURS, HE WILL WATCH THE VOLTMETER AND BE PREPARED TO SWITCH OFF THE POWER TO THE EQUIPMENT WHEN THE VOLTAGE FALLS BELOW 110 VOLTS FOR MORE THAN 30 SECONDS. IF THE VOLTAGE SHOULD SUDDENLY FALL BELOW 100 VOLTS, THE TRANSMITTER WILL BECOME INOPERATIVE AND THE SIGNALS ON THE INDICATOR WILL EITHER DISAPPEAR OR BECOME UNREADABLE.

NOTE: THE MODEL ASB-5 AIRCRAFT RADAR EQUIPMENT SHOULD NEVER BE OPERATED AT A VOLTAGE IN EXCESS OF 120 VOLTS. OPERATION AT A VOLTAGE GREATER THAN 120 VOLTS WILL SUBJECT THE ELECTROLYTIC CAPACITOR IN THE RECTIFIER POWER UNIT TO AN EXCESSIVELY HIGH VOLTAGE WHICH MAY SHORTEN ITS LIFE.

WARNING: THE POWER SWITCH ON THE POWER CONTROL UNIT MUST NEVER BE TURNED ON UNLESS ALL UNITS ARE CONNECTED TO THE RECTIFIER POWER UNIT. IF THE POWER IS TURNED ON WITH ANY UNITS DISCONNECTED, THE VOLTAGE MAY RISE SUFFICIENTLY HIGH TO CAUSE THE ELECTROLYTIC CAPACITOR IN THE RECTIFIER POWER UNIT TO BREAK DOWN.

4.01-OPERATING CONTROLS—The controls necessary to operate the Model ASB-5 Aircraft Radar Equipment include those located on the front panels of the Indicator, the Power Control Unit, and the remote receiver tuning control, which may be fastened to either side of the Indicator or may be located separately, according to the requirements of the installation.

The controls, shown in Figure 3 and Figure 6, are as follows:

On the Power Control Unit

(a) OFF-WAIT 5 SEC.-ON power switch
(b) Voltage adjustment switches—These may be inoperative—See section 2.09 (c)

On the Indicator

(a) BRILLiance
(b) FOCUS
(c) RECeiver GAIN
(d) RANGE
(e) Horizontal CENTering
(f) Vertical CENTering
(g) Receiver Tuning (Location optional)

4.02-OPERATING PROCEDURE—To place the equipment in operation, proceed as follows:

(a) Switch all compensating capacitor switches to OUT.

(b) Turn the power switch clockwise to the intermediate WAIT 5 SEC. position.

This operation supplies power to the equipment.

(c) Note the voltage indicated by the voltmeter on the Power Control Unit. This voltage will vary with different power sources, but it is suggested that the operator memorize the normal operating voltage to be expected. If the voltage deviates substantially from the normal value, the equipment, including the source of power, should be checked by a maintenance man before it is placed in operation. In no case, should the voltage fall outside the limits mentioned in the WARNING NOTE at the beginning of Section IV.

(d) After waiting at least 5 seconds, turn the power switch fully clockwise to the ON position.

This operation will not necessarily place the equipment in immediate operation since an automatic time delay circuit is incorporated in the equipment. However, within one minute the luminous base line (vertical trace) should appear on the screen of the Indicator as viewed through the hood or light shield. The equipment will stabilize itself within the next few minutes. The a-c voltage supplied to the equipment should then be as near 115 volts as possible.

(e) If the supply voltage is outside of the range 110–120 volts, faulty operation may result. *An attempt should always be made to adjust the voltage as nearly as possible to 115 volts.* This is accomplished by means of the compensating capacitor switches located on the front panel of the Power Control Unit, if the capacitors have not been short circuited as mentioned in section 2.09 (c)

An increase in capacitance will normally increase the voltage and vice versa.

The capacitance value is marked above each toggle switch as shown in Figure 3.

(f) If the base line (vertical trace) fails to appear, turn the BRILLiance control on the Indicator clockwise (if necessary, to the extreme

position). If the base line does not appear with the BRILLiance control turned fully clockwise, a fuse on the Power Control Unit may be burned out, and the operator should proceed as follows:

If only a luminous spot appears near the lower edge of the screen, the three-ampere fuse located on the right side below the voltmeter may have burned out. A replacement fuse is located on the front panel of the Power Control Unit in the right hand holder marked SPARES. The three-ampere fuse is the one most likely to burn out and should therefore be checked first.

If the screen is not luminous at any spot, the two ampere fuse located on the left side below the voltmeter may have burned out. A replacement fuse is located on the front panel of the Power Control Unit, in the left hand holder marked SPARES.

If the foregoing procedure fails to put the equipment in operation, make sure that all cable connectors are seated firmly. If this also fails, a maintenance man should be called.

(g) After the base line has appeared on the screen, adjust the BRILLiance control to secure the desired brilliancy of the trace, and adjust the FOCUS control to provide sharp definition of the trace. The action of these two controls is closely related and therefore they should always be adjusted and checked together. In general, it is desirable to have the maximum brilliancy consistent with sharp definition. Since the apparent definition of the trace usually becomes poorer with increasing brilliance, it is necessary for the operator to select the BRILLiance and FOCUS settings which will enable him to use the equipment most efficiently.

(h) Check the calibration of the Indicator by ascertaining that the base line or vertical trace registers accurately with the center line marks of the scale calibration, both as to position and as to limits, when viewed centrally through the light shield The base line can be shifted in position by adjusting the H. CENT. and V. CENT. controls with a screwdriver. If, *with normal input voltage,* these adjustments fail to register *both ends* of the base line accurately with the scale limits, the Indicator will require calibration by a trained maintenance man before the equipment can be operated.

(i) At all times, the operator should endeavor to keep the Aircraft Radar Receiver tuned to the proper frequency. To accomplish this, proceed as follows:

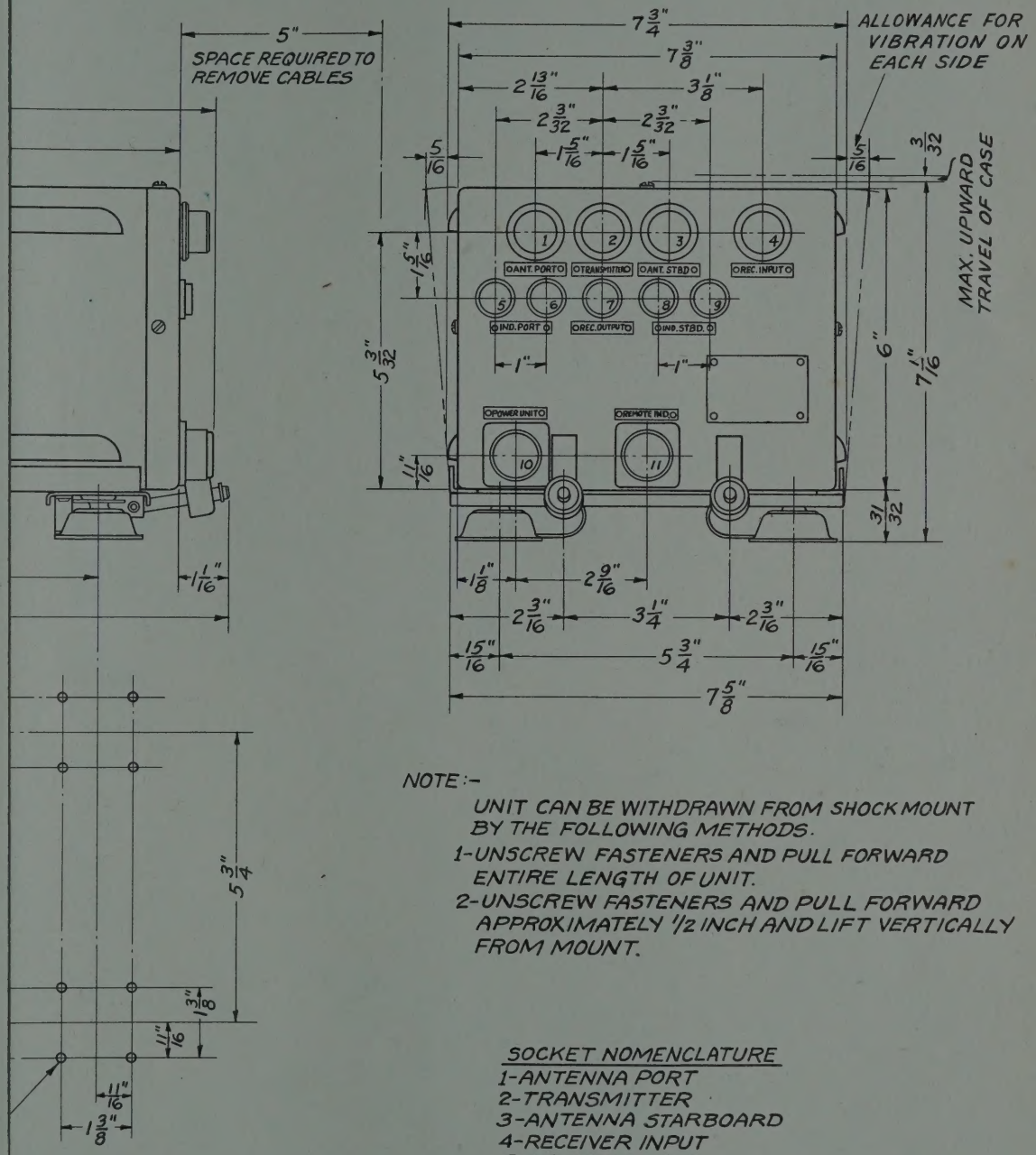
Select a signal which does not reach the saturation level (saturation results in a flat-topped trace) and which is separated from any other signal trace which reaches the saturation level. In general, an indication having the maximum possible range should be selected. The RECeiver GAIN control, located on the Indicator, may be used to reduce the response until the signal is below the saturation level.

Tune the Receiver for maximum indicated response, again reducing the gain, if necessary, to avoid saturation.

Over extended periods of operation, the tuning of the Aircraft Radar Receiver should be checked as often as is possible.

(j) The Aircraft Radar Receiver has been designed with a liberal amount of sensitivity, as evidenced by the "grass" appearing as a fringe on either side of the base line. It will normally be found advantageous to reduce the sensitivity, by means of the RECeiver GAIN control, until the solid part of the "grass" does not extend for more than $\frac{1}{4}$ inch to $\frac{3}{8}$ inch on either side of the base line. However, the operator may find that he is better able to observe the indications on the screen at a different sensitivity level. This often depends upon the type of service being performed.

(k) From the type of service being performed, the operator will at all times know which range should be used. The RANGE control on the front panel of the Indicator should be turned to the proper position.



NOTE:-

UNIT CAN BE WITHDRAWN FROM SHOCK MOUNT BY THE FOLLOWING METHODS.

1-UNSCREW FASTENERS AND PULL FORWARD ENTIRE LENGTH OF UNIT.

2-UNSCREW FASTENERS AND PULL FORWARD APPROXIMATELY 1/2 INCH AND LIFT VERTICALLY FROM MOUNT.

SOCKET NOMENCLATURE

1-ANTENNA PORT
2-TRANSMITTER
3-ANTENNA STARBOARD
4-RECEIVER INPUT
5-INDICATOR PORT
6-INDICATOR PORT
7-RECEIVER OUTPUT
8-INDICATOR STARBOARD
9-INDICATOR STARBOARD
10-POWER UNIT
11-REMOTE INDICATOR

EIGHT OF SWITCHING UNIT = 13.00 LBS.
EIGHT OF MOUNTING BASE = .75 LBS.
TOTAL WEIGHT = 13.75 LBS.

FIGURE 1 — TYPE CRR-14AAG ANTENNA SWITCHING UNIT, OUTLINE AND MOUNTING DIMENSIONS

position). If the base line does not appear with the BRILLiance control turned fully clockwise, a fuse on the Power Control Unit may be burned out, and the operator should proceed as follows:

If only a luminous spot appears near the lower edge of the screen, the three-ampere fuse located on the right side below the voltmeter may have burned out. A replacement fuse is located on the front panel of the Power Control Unit in the right hand holder marked SPARES. The three-ampere fuse is the one most likely to burn out and should therefore be checked first.

If the screen is not luminous at any spot, the two ampere fuse located on the left side below the voltmeter may have burned out. A replacement fuse is located on the front panel of the Power Control Unit, in the left hand holder marked SPARES.

If the foregoing procedure fails to put the equipment in operation, make sure that all cable connectors are seated firmly. If this also fails, a maintenance man should be called.

(g) After the base line has appeared on the screen, adjust the BRILLiance control to secure the desired brilliancy of the trace, and adjust the FOCUS control to provide sharp definition of the trace. The action of these two controls is closely related and therefore they should always be adjusted and checked together. In general, it is desirable to have the maximum brilliancy consistent with sharp definition. Since the apparent definition of the trace usually becomes poorer with increasing brilliance, it is necessary for the operator to select the BRILLiance and FOCUS settings which will enable him to use the equipment most efficiently.

(h) Check the calibration of the Indicator by ascertaining that the base line or vertical trace registers accurately with the center line marks of the scale calibration, both as to position and as to limits, when viewed centrally through the light shield The base line can be shifted in position by adjusting the H. CENT. and V. CENT. controls with a screwdriver. If, *with normal input voltage*, these adjustments fail to register *both ends* of the base line accurately with the scale limits, the Indicator will require calibration by a trained maintenance man before the equipment can be operated.

(i) At all times, the operator should endeavor to keep the Aircraft Radar Receiver tuned to the proper frequency. To accomplish this, proceed as follows:

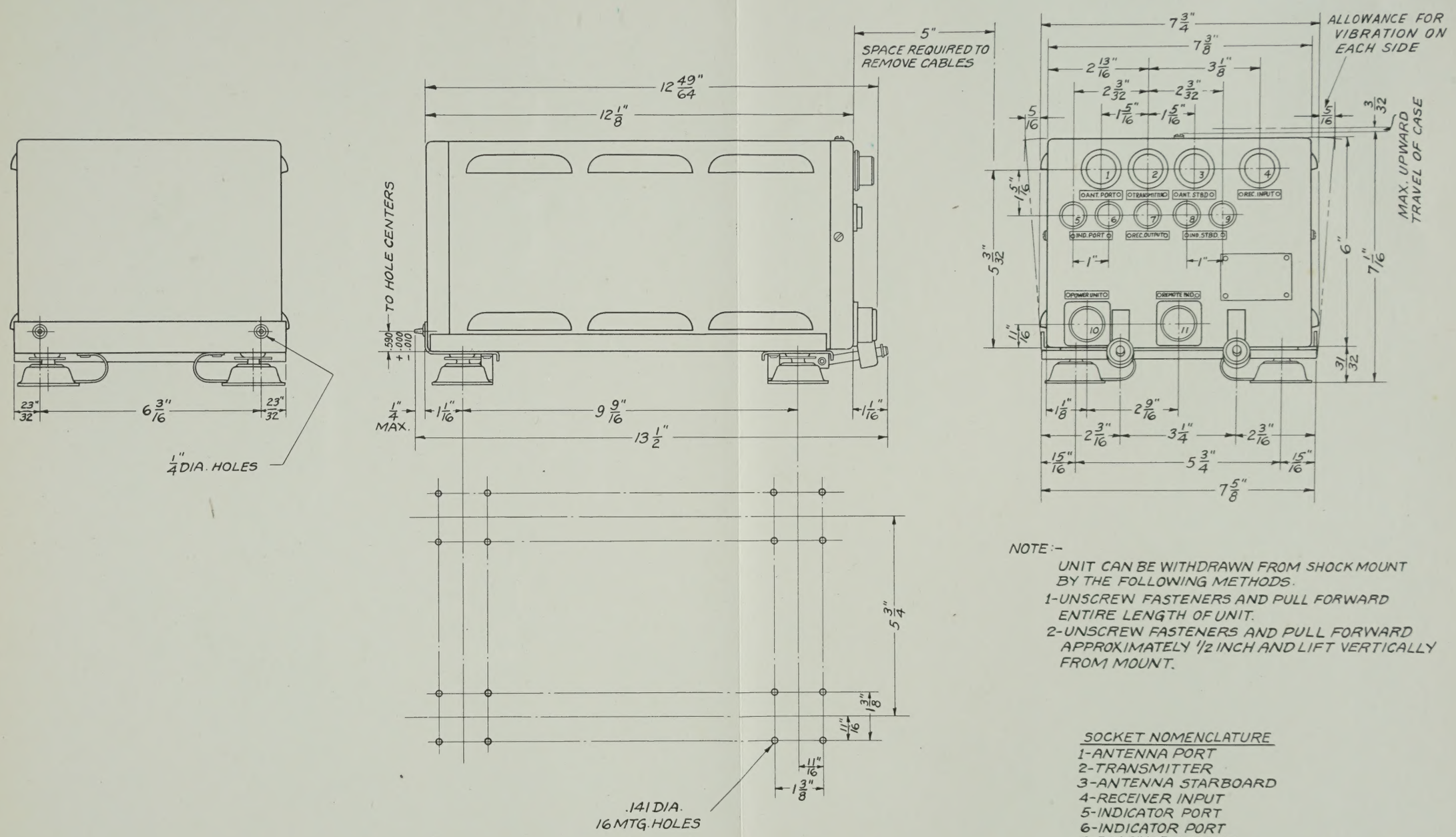
Select a signal which does not reach the saturation level (saturation results in a flat-topped trace) and which is separated from any other signal trace which reaches the saturation level. In general, an indication having the maximum possible range should be selected. The RECeiver GAIN control, located on the Indicator, may be used to reduce the response until the signal is below the saturation level.

Tune the Receiver for maximum indicated response, again reducing the gain, if necessary, to avoid saturation.

Over extended periods of operation, the tuning of the Aircraft Radar Receiver should be checked as often as is possible.

(j) The Aircraft Radar Receiver has been designed with a liberal amount of sensitivity, as evidenced by the "grass" appearing as a fringe on either side of the base line. It will normally be found advantageous to reduce the sensitivity, by means of the RECeiver GAIN control, until the solid part of the "grass" does not extend for more than $\frac{1}{4}$ inch to $\frac{3}{8}$ inch on either side of the base line. However, the operator may find that he is better able to observe the indications on the screen at a different sensitivity level. This often depends upon the type of service being performed.

(k) From the type of service being performed, the operator will at all times know which range should be used. The RANGE control on the front panel of the Indicator should be turned to the proper position.



NOTE:-

UNIT CAN BE WITHDRAWN FROM SHOCK MOUNT BY THE FOLLOWING METHODS.

1-UNSCREW FASTENERS AND PULL FORWARD ENTIRE LENGTH OF UNIT.

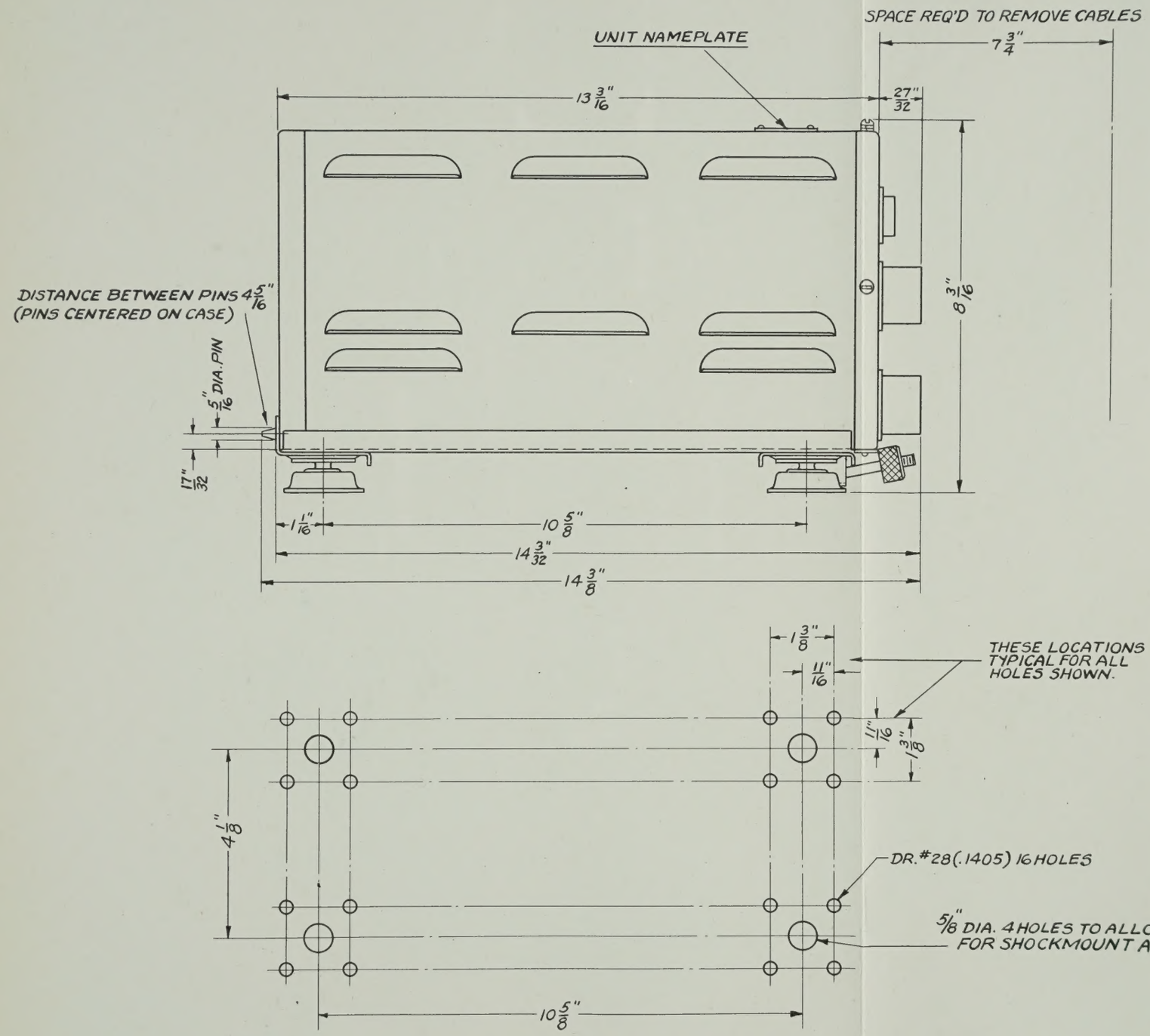
2-UNSCREW FASTENERS AND PULL FORWARD APPROXIMATELY 1/2 INCH AND LIFT VERTICALLY FROM MOUNT.

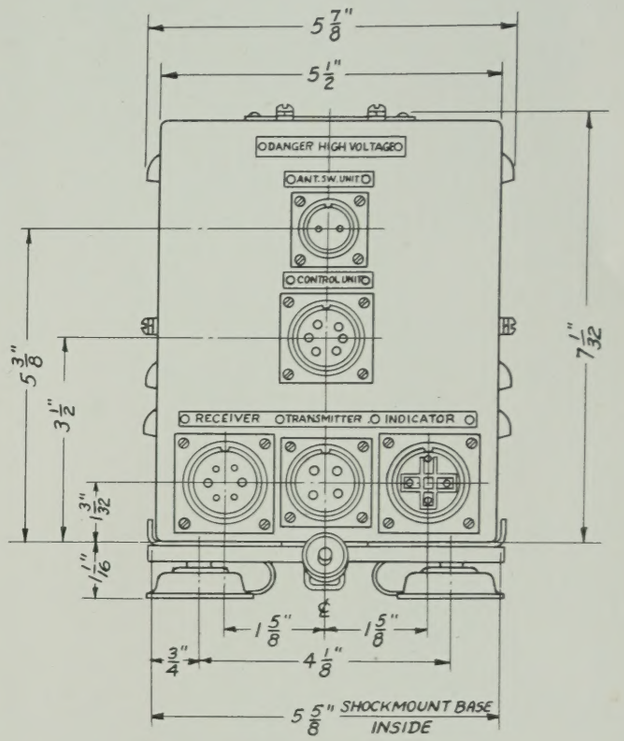
WEIGHT OF SWITCHING UNIT = 13.00 LBS.
WEIGHT OF MOUNTING BASE = .75 LBS.
TOTAL WEIGHT = 13.75 LBS.

SOCKET NOMENCLATURE

1-ANTENNA PORT
2-TRANSMITTER
3-ANTENNA STARBOARD
4-RECEIVER INPUT
5-INDICATOR PORT
6-INDICATOR PORT
7-RECEIVER OUTPUT
8-INDICATOR STARBOARD
9-INDICATOR STARBOARD
10-POWER UNIT
11-REMOTE INDICATOR

FIGURE 1 — TYPE CRR-14AAG ANTENNA SWITCHING UNIT, OUTLINE AND MOUNTING DIMENSIONS





ALLOW ONE INCH ON ALL SIDES OF UNIT FOR OPERATION OF SHOCKMOUNTS.

WEIGHT OF POWER UNIT — 15.2 LBS.
WEIGHT OF MTG. BASE — 0.8 LBS.
TOTAL WEIGTH — 16.0 LBS.

FIGURE 2 — TYPE CQW-20ABV RECTIFIER POWER UNIT, OUTLINE AND MOUNTING DIMENSIONS

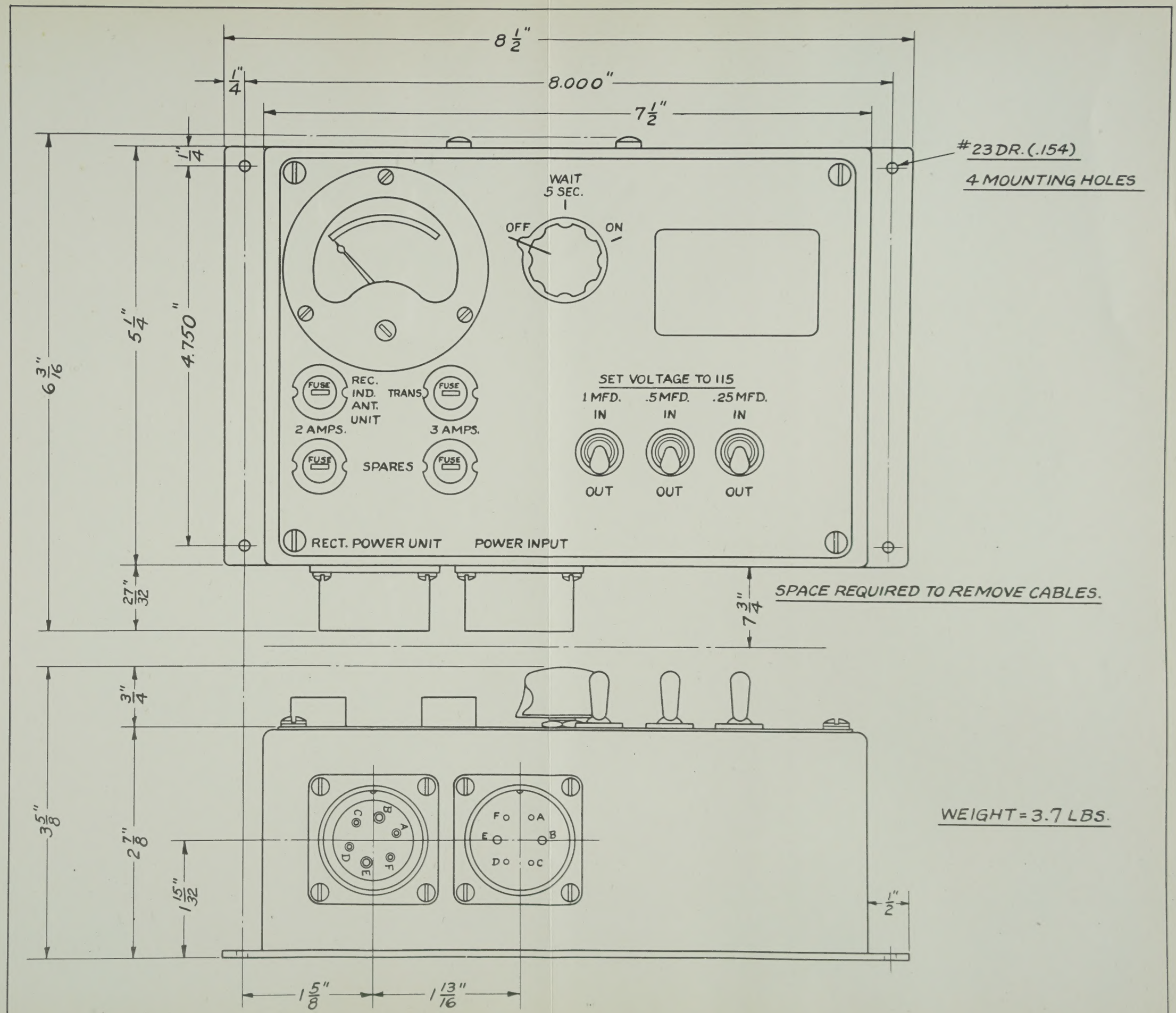
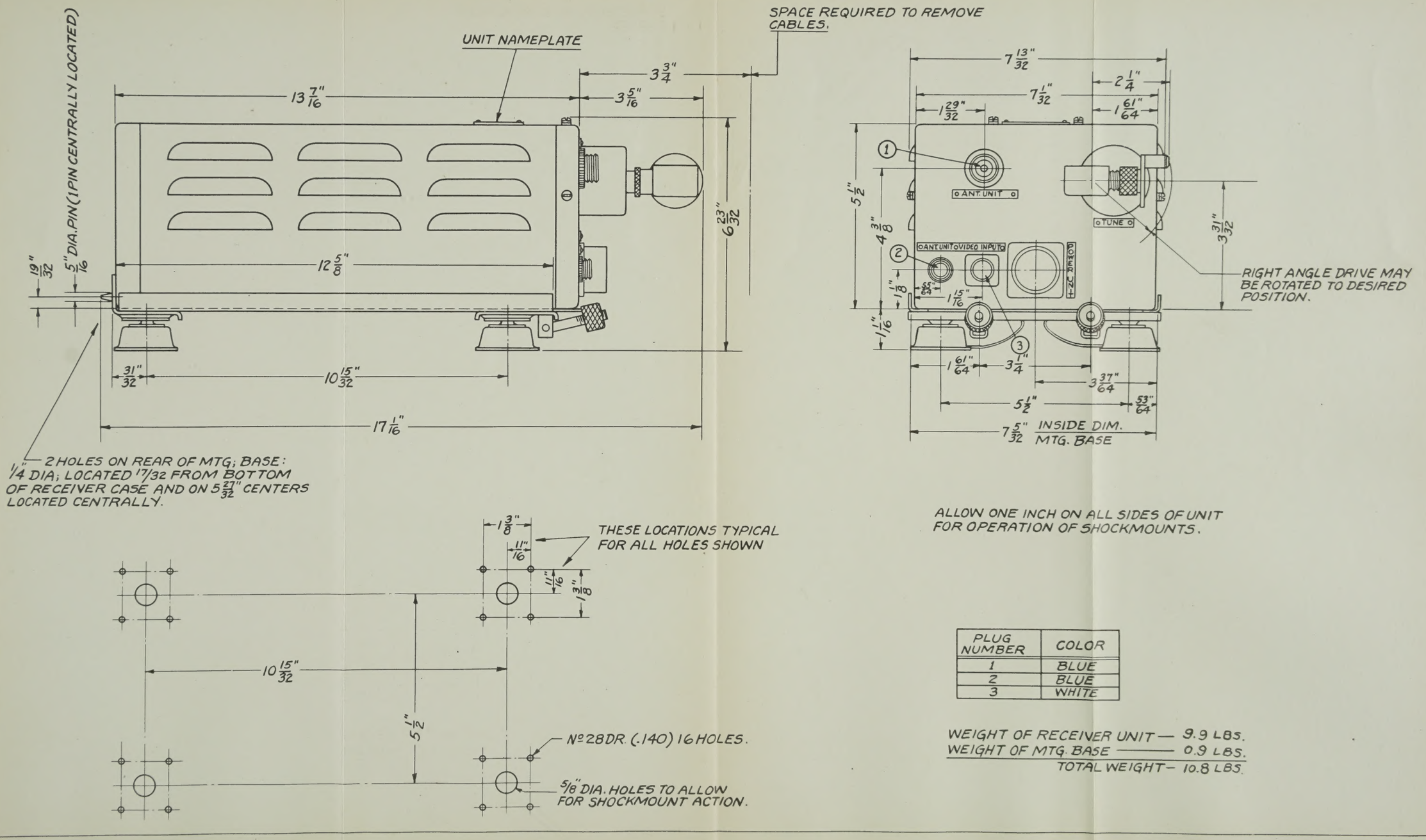


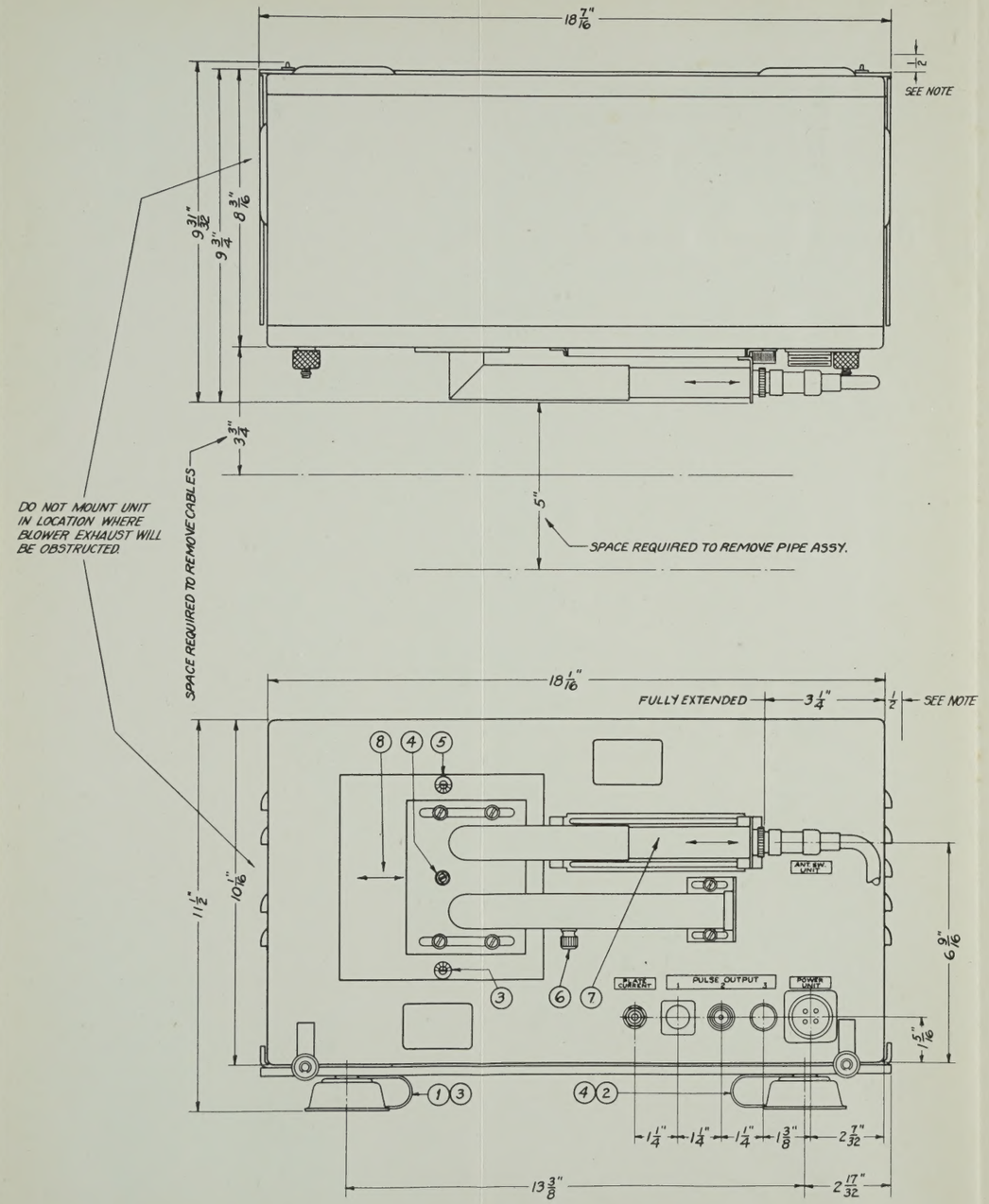
FIGURE 3 — TYPE CQC-23ACP POWER CONTROL UNIT, OUTLINE AND MOUNTING DIMENSIONS



PLUG NUMBER	COLOR
1	BLUE
2	BLUE
3	WHITE

WEIGHT OF RECEIVER UNIT — 9.9 LBS.
WEIGHT OF MTG. BASE — 0.9 LBS.
TOTAL WEIGHT — 10.8 LBS.

FIGURE 4 — TYPE CQW-46ABO AIRCRAFT RADAR RECEIVER, OUTLINE AND MOUNTING DIMENSIONS



NOTE:-
ALLOW ½ IN. ON SIDES FOR VIBRATION OR SIDE SWAY ON SHOCK ABSORBERS
UNIT CAN BE WITHDRAWN FROM SHOCKMOUNT BY THE FOLLOWING METHODS.
1- UNSCREW FASTNERS AND PULL FORWARD ENTIRE DEPTH OF UNIT.
2- UNSCREW FASTNERS AND PULL FORWARD APPROXIMATELY ½ INCH AND LIFT VERTICALLY FROM MOUNT.

UNMARKED CONTROLS:-

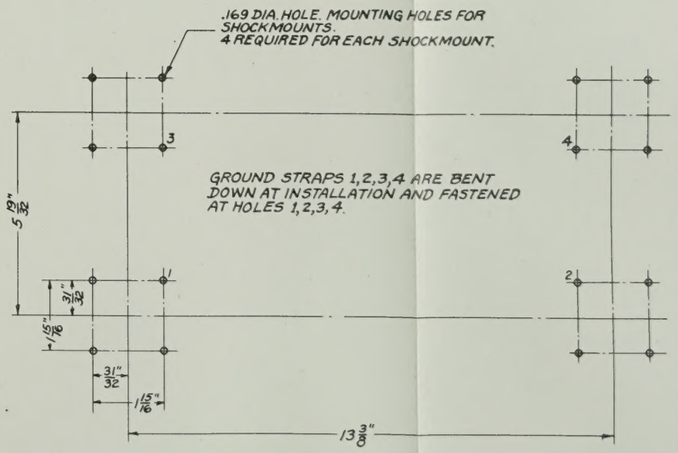
(3) (5) VERNIER FREQUENCY CONTROLS.

(4) OUTPUT CAPACITY CONTROL.

(6) COUPLING CONTROL.

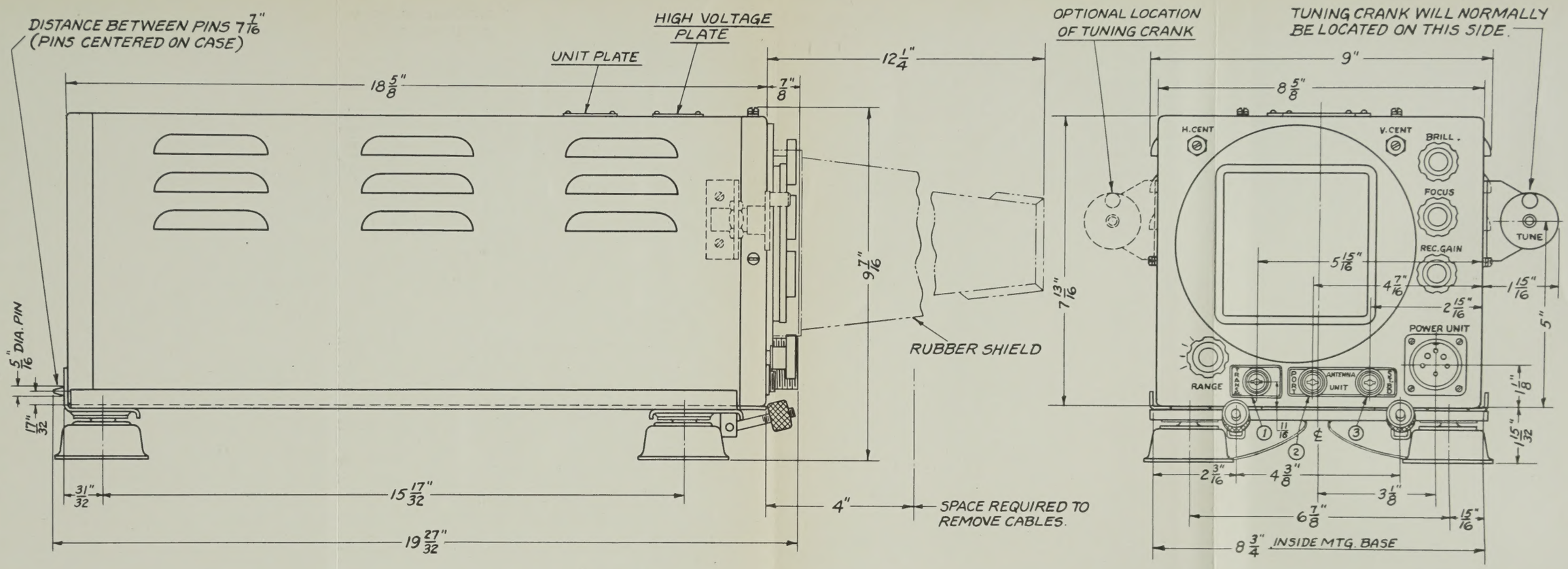
(7) OUTPUT CABLE LENGTH VARIATION.

(8) LOOP COUPLING VARIATION.



WEIGHT IN POUNDS
TRANSMITTER 24.3
SHOCK MOUNTING 2.0

FIGURE 5 — TYPE CRR-52A/BL AIRCRAFT RADAR TRANSMITTER, OUTLINE AND MOUNTING DIMENSIONS



PLUG NUMBER	COLOR
1	YELLOW
2	RED
3	GREEN

ALLOW ONE INCH ON ALL SIDES OF UNIT FOR OPERATION OF SHOCKMOUNTS.

WEIGHT OF INDICATOR UNIT (LESS LIGHT SHIELD & MOUNTING BASE)	18.6 LBS.
WEIGHT OF SHOCK MOUNTING BASE ONLY	1.7 LBS
WEIGHT OF INDICATOR UNIT WITH MOUNTING BASE (LESS LIGHT SHIELD)	20.3 LBS
WEIGHT OF RUBBER LIGHT SHIELD	1.5 LBS

TOTAL WEIGHT OF COMPLETE INDICATOR UNIT WITH RUBBER LIGHT SHIELD 21.8 LBS

NOTE: ABOVE WEIGHTS DO NOT INCLUDE TUNING CRANK.

FIGURE 6 — TYPE CQC-55ACB INDICATOR, OUTLINE AND MOUNTING DIMENSIONS

FIGURE 7 — TYPE CRB-62AAV JUNCTION BOX, OUTLINE AND MOUNTING DIMENSIONS

NOTE:- LETTERS (P) AND (S) AT ENDS OF POWER CABLES INDICATE PLUG (MALE) AND SOCKET (FEMALE) ENDS OF CABLE, RESPECTIVELY.

AIRCRAFT RADAR TRANSMITTER

ANT. SW. UNIT

PLATE CURRENT

PULSE OUTPUT 1 2 3

POWER UNIT

RECTIFIER POWER UNIT

DANGER HIGH VOLTAGE

ANT. SW. UNIT

CONTROL UNIT

RECEIVER TRANSMITTER INDICATOR

POWER CONTROL UNIT

WAIT 3 SEC.

OFF ON

REC. IND. ANT. UNIT 2 AMPS.

TRANS 3 AMPS.

SPARES

SET VOLTAGE TO 115

1 MFD. IN OUT

.5 MFD IN OUT

.25 MFD. IN OUT

RECT. POWER UNIT POWER INPUT

CABLE Nº 2
BENDIX Nº AC59203

CABLE Nº 1
BENDIX Nº AC59202

POWER GENERATOR

CABLE Nº 3
BENDIX Nº AC59264

CABLE Nº 6
BENDIX Nº AC59215

CABLE Nº 5
BENDIX Nº AC59201

CABLE Nº 11 (YELLOW)
BENDIX Nº AL73624-3

CABLE Nº 7 (YELLOW)
BENDIX Nº AC59214-1

NOTE:- TUNING CRANK IS NORMALLY ATTACHED DIRECTLY TO RECEIVER, IN WHICH CASE RECEIVER MUST BE LOCATED WITHIN EASY REACH OF THE OPERATOR.
IF REMOTE CONTROL IS DESIRED, REMOTE TUNER MAY BE MOUNTED ON EITHER SIDE OF INDICATOR OR ON OTHER STRUCTURE CONVENIENT TO OPERATOR. IN THIS CASE THE TUNING CRANK IS REMOVED FROM THE RECEIVER AND ATTACHED TO THE REMOTE TUNER AND A FLEXIBLE SHAFT IS USED TO COUPLE THE RECEIVER TO THE REMOTE TUNER. RECEIVER MAY THEN BE MOUNTED IN BAGGAGE COMPARTMENT.

STBD CABLE Nº 14 (GREEN)
BENDIX Nº AL73624-2

TO ANTENNA

PORT CABLE Nº 13 (RED)
BENDIX Nº AL73624-1

ANTENNA SWITCHING UNIT

ANT. PORT TRANSMITTER ANT. STBD REC. INPUT

IND. PORT REC. OUTPUT IND. STBD

POWER UNIT REMOTE IND.

CABLE Nº 12 (BLUE)
BENDIX Nº AL73624-4

AIRCRAFT RADAR RECEIVER

ANT. UNIT

TUNE

ANT. UNIT VIDEO INPUT

INDICATOR

H. CENT V. CENT BRILL. FOCUS REC. GAIN

RANGE

ANTENNA UNIT

POWER UNIT

FLEXIBLE TUNING SHAFT.
BENDIX Nº AA109252

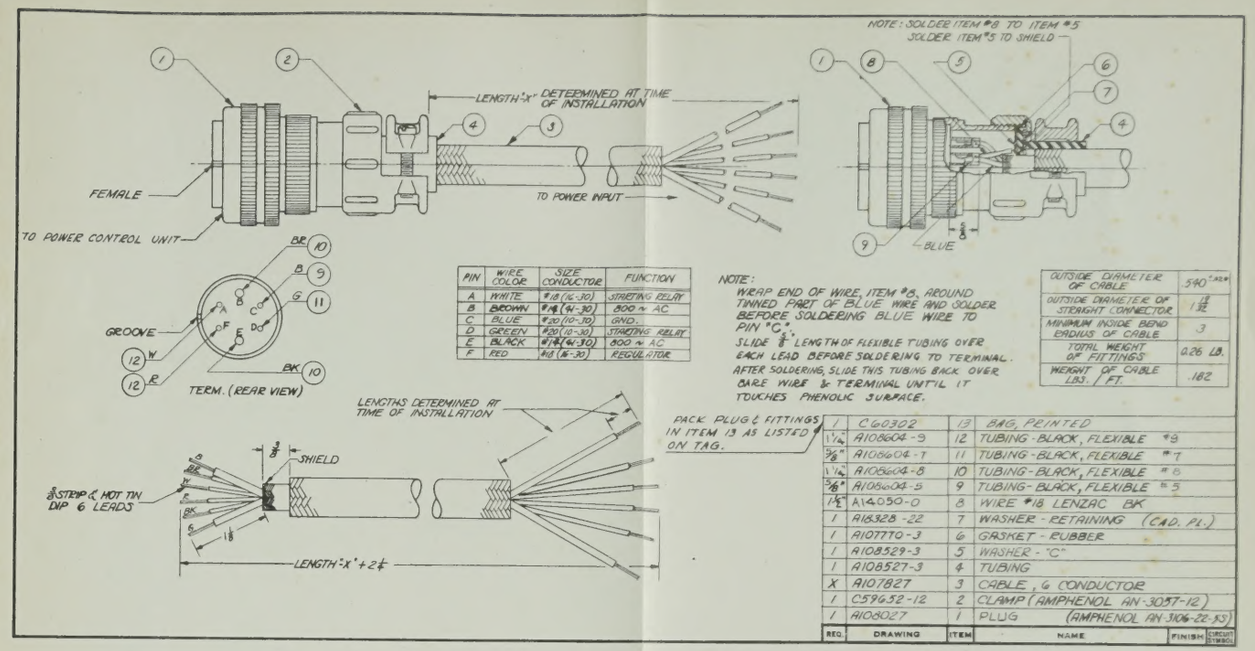
CABLE Nº 8 (BLUE)
BENDIX Nº AC59214-2

CABLE Nº 10 (GREEN)
BENDIX Nº AC59214-3

CABLE Nº 4
BENDIX Nº AC59200

CABLE Nº 9 (RED)
BENDIX Nº AC59214-4

FIGURE 8 — MODEL ASB-5 AIRCRAFT RADAR EQUIPMENT, TYPICAL CABLING DIAGRAM

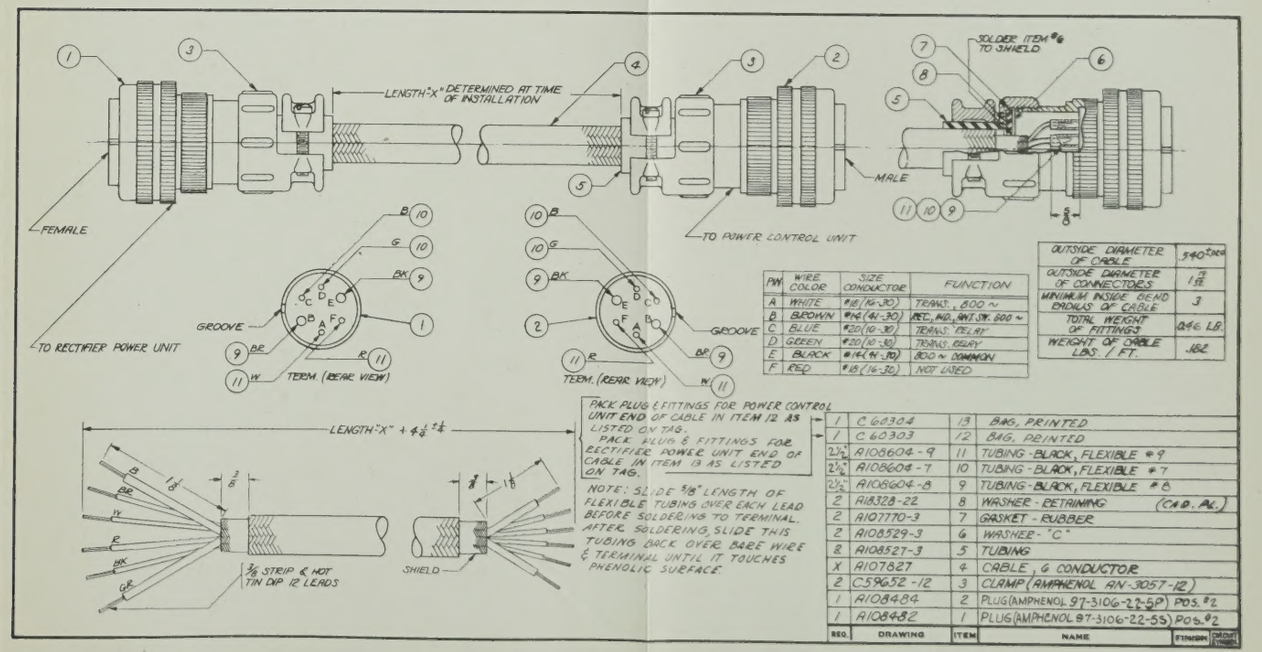

NOTE: SOLDER ITEM #8 TO ITEM #5
SOLDER ITEM #5 TO SHIELD
LENGTH "X" DETERMINED AT TIME OF INSTALLATION
FEMALE
TO POWER INPUT
TO POWER CONTROL UNIT
BLUE
GROOVE
TERM. (REAR VIEW)
LENGTHS DETERMINED AT TIME OF INSTALLATION
SHIELD
STRIP & HOT TIN DIP 6 LEADS
LENGTH "X" + 2"
NOTE:
WRAP END OF WIRE, ITEM #8, AROUND TINNED PART OF BLUE WIRE AND SOLDER BEFORE SOLDERING BLUE WIRE TO PIN "C".
SLIDE 5/8" LENGTH OF FLEXIBLE TUBING OVER EACH LEAD BEFORE SOLDERING TO TERMINAL. AFTER SOLDERING, SLIDE THIS TUBING BACK OVER BARE WIRE & TERMINAL UNTIL IT TOUCHES PHENOLIC SURFACE.
PACK PLUG & FITTINGS IN ITEM 13 AS LISTED ON TAG.

PIN	WIRE COLOR	SIZE CONDUCTOR	FUNCTION
A	WHITE	#18 (16-30)	STARTING RELAY
B	BROWN	#16 (14-30)	800 ~ AC
C	BLUE	#20 (10-30)	GND.
D	GREEN	#20 (10-30)	STARTING RELAY
E	BLACK	#16 (14-30)	800 ~ AC
F	RED	#18 (16-30)	REGULATOR

OUTSIDE DIAMETER OF CABLE	.540" MAX
OUTSIDE DIAMETER OF STRAIGHT CONNECTOR	1 3/32
MINIMUM INSIDE BEND RADIUS OF CABLE	3
TOTAL WEIGHT OF FITTINGS	.026 LB.
WEIGHT OF CABLE LBS. / FT.	.182

REQ.	DRAWING	ITEM	NAME	FINISH	CIRCUIT SYMBOL
1	C60302	13	BAG, PRINTED		
1 1/4"	A1086O4-9	12	TUBING - BLACK, FLEXIBLE #9		
3/8"	A1086O4-7	11	TUBING - BLACK, FLEXIBLE #7		
1 1/4"	A1086O4-8	10	TUBING - BLACK, FLEXIBLE #8		
3/8"	A1086O4-5	9	TUBING - BLACK, FLEXIBLE #5		
1 1/2"	A14050-0	8	WIRE #18 LENZAC BK		
1	A18328-22	7	WASHER - RETAINING (C.A.D. PL.)		
1	A107770-3	6	GASKET - RUBBER		
1	A108529-3	5	WASHER - "C"		
1	A108527-3	4	TUBING		
X	A107827	3	CABLE, 6 CONDUCTOR		
1	C59652-12	2	CLAMP (AMPHENOL AN-3057-12)		
1	A108027	1	PLUG (AMPHENOL AN-3106-22-5S)		

FIGURE 9 — CABLE #1, ASSEMBLY DRAWING

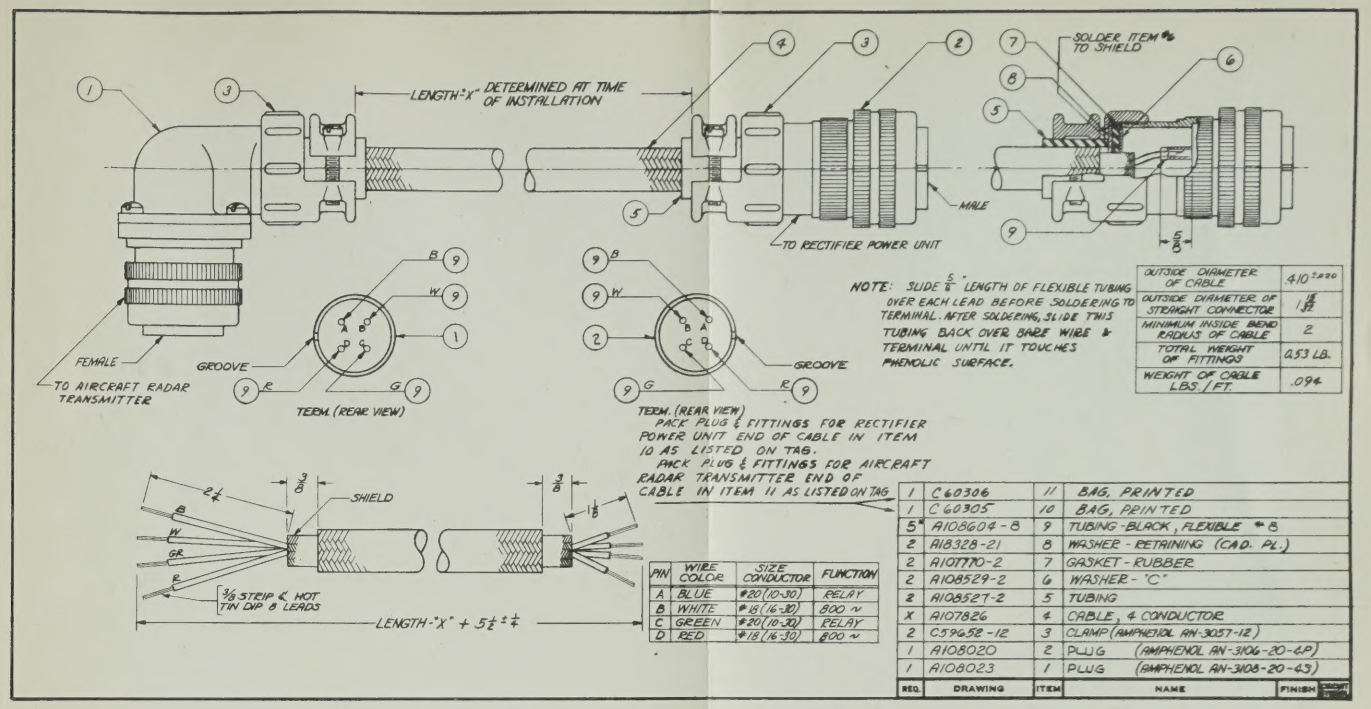

LENGTH "X" DETERMINED AT TIME OF INSTALLATION
SOLDER ITEM #6 TO SHIELD
FEMALE
MALE
TO POWER CONTROL UNIT
TO RECTIFIER POWER UNIT
GROOVE
TERM. (REAR VIEW)
LENGTH "X" + 4 1/2"
3/8 STRIP & HOT TIN DIP 12 LEADS
SHIELD
NOTE: SLIDE 5/8" LENGTH OF FLEXIBLE TUBING OVER EACH LEAD BEFORE SOLDERING TO TERMINAL. AFTER SOLDERING, SLIDE THIS TUBING BACK OVER BARE WIRE & TERMINAL UNTIL IT TOUCHES PHENOLIC SURFACE.
PACK PLUG & FITTINGS FOR POWER CONTROL UNIT END OF CABLE IN ITEM 12 AS LISTED ON TAG.
PACK PLUG & FITTINGS FOR RECTIFIER POWER UNIT END OF CABLE IN ITEM 13 AS LISTED ON TAG.

PIN	WIRE COLOR	SIZE CONDUCTOR	FUNCTION
A	WHITE	#18 (16-30)	TRANS., 800 ~
B	BROWN	#16 (14-30)	REC. IND., INT. SW. 800 ~
C	BLUE	#20 (10-30)	TRANS. RELAY
D	GREEN	#20 (10-30)	TRANS. RELAY
E	BLACK	#16 (14-30)	800 ~ COMMON
F	RED	#18 (16-30)	NOT USED

OUTSIDE DIAMETER OF CABLE	.540" MAX
OUTSIDE DIAMETER OF CONNECTORS	1 3/32
MINIMUM INSIDE BEND RADIUS OF CABLE	3
TOTAL WEIGHT OF FITTINGS	.046 LB.
WEIGHT OF CABLE LBS. / FT.	.182

REQ.	DRAWING	ITEM	NAME	FINISH	CIRCUIT SYMBOL
1	C60304	13	BAG, PRINTED		
1	C60303	12	BAG, PRINTED		
2 1/2"	A1086O4-9	11	TUBING - BLACK, FLEXIBLE #9		
2 1/2"	A1086O4-7	10	TUBING - BLACK, FLEXIBLE #7		
2 1/2"	A1086O4-8	9	TUBING - BLACK, FLEXIBLE #8		
2	A18328-22	8	WASHER - RETAINING (C.A.D. AL.)		
2	A107770-3	7	GASKET - RUBBER		
2	A108529-3	6	WASHER - "C"		
8	A108527-3	5	TUBING		
X	A107827	4	CABLE, 6 CONDUCTOR		
2	C59652-12	3	CLAMP (AMPHENOL AN-3057-12)		
1	A108484	2	PLUG (AMPHENOL 97-3106-22-5P) POS. #2		
1	A108482	1	PLUG (AMPHENOL 97-3106-22-5S) POS. #2		

FIGURE 10 — CABLE #2, ASSEMBLY DRAWING

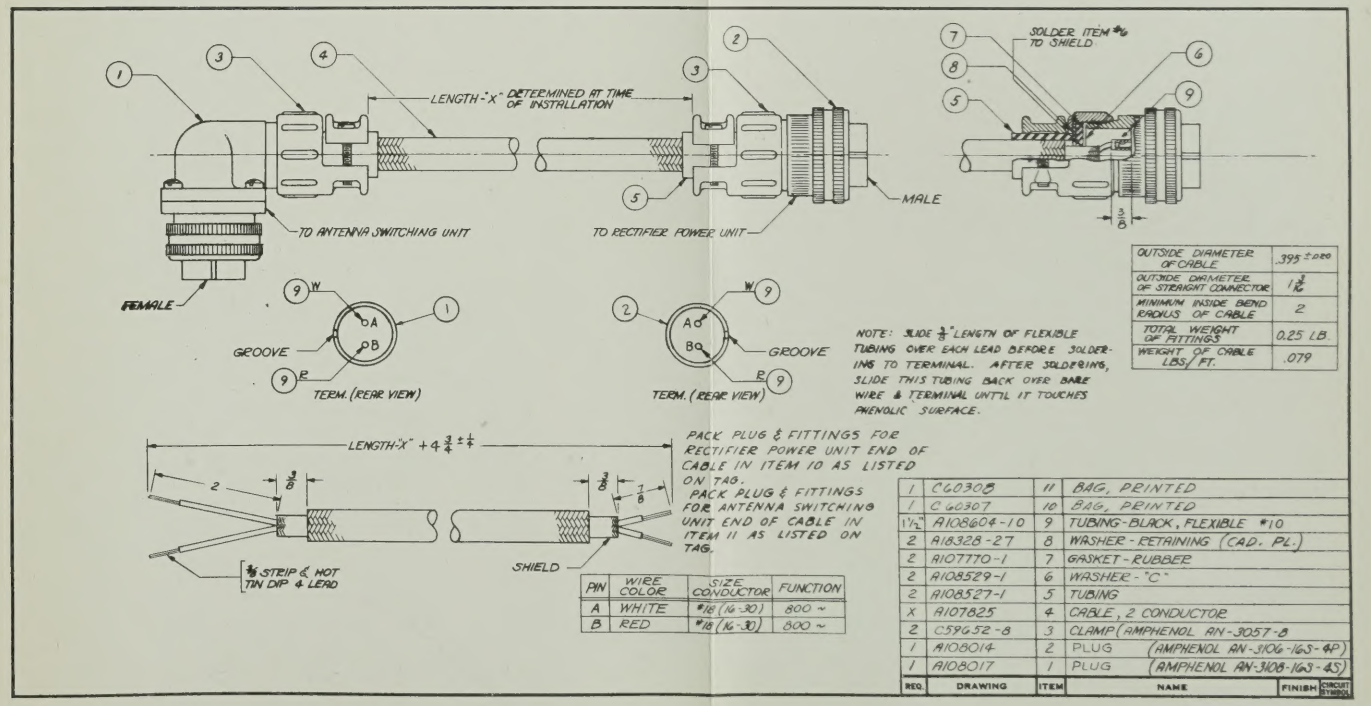

LENGTH "X" DETERMINED AT TIME OF INSTALLATION
SOLDER ITEM #6 TO SHIELD
MALE
TO RECTIFIER POWER UNIT
FEMALE
TO AIRCRAFT RADAR TRANSMITTER
GROOVE
TERM. (REAR VIEW)
NOTE: SLIDE 5/8" LENGTH OF FLEXIBLE TUBING OVER EACH LEAD BEFORE SOLDERING TO TERMINAL. AFTER SOLDERING, SLIDE THIS TUBING BACK OVER BARE WIRE & TERMINAL UNTIL IT TOUCHES PHENOLIC SURFACE.
PACK PLUG & FITTINGS FOR RECTIFIER POWER UNIT END OF CABLE IN ITEM 10 AS LISTED ON TAG.
PACK PLUG & FITTINGS FOR AIRCRAFT RADAR TRANSMITTER END OF CABLE IN ITEM 11 AS LISTED ON TAG
SHIELD
3/16 STRIP & HOT TIN DIP 8 LEADS
LENGTH "X" + 5 1/2 ± 1/4

OUTSIDE DIAMETER OF CABLE	.410 ±.020
OUTSIDE DIAMETER OF STRAIGHT CONNECTOR	1 5/32
MINIMUM INSIDE BEND RADIUS OF CABLE	2
TOTAL WEIGHT OF FITTINGS	0.53 LB.
WEIGHT OF CABLE LBS./FT.	.094

PIN	WIRE COLOR	SIZE CONDUCTOR	FUNCTION
A	BLUE	#20 (10-30)	RELAY
B	WHITE	#18 (16-30)	800 ~
C	GREEN	#20 (10-30)	RELAY
D	RED	#18 (16-30)	800 ~

REQ.	DRAWING	ITEM	NAME	FINISH
1	C60306	11	BAG, PRINTED	
1	C60305	10	BAG, PRINTED	
5"	A108604-8	9	TUBING-BLACK, FLEXIBLE #8	
2	A18328-21	8	WASHER-RETAINING (CAD. PL.)	
2	A107770-2	7	GASKET-RUBBER	
2	A108529-2	6	WASHER-"C"	
2	A108527-2	5	TUBING	
X	A107826	4	CABLE, 4 CONDUCTOR	
2	C59652-12	3	CLAMP (AMPHENOL AN-3057-12)	
1	A108020	2	PLUG (AMPHENOL AN-3106-20-6P)	
1	A108023	1	PLUG (AMPHENOL AN-3108-20-4S)	

FIGURE 11 — CABLE #3, ASSEMBLY DRAWING

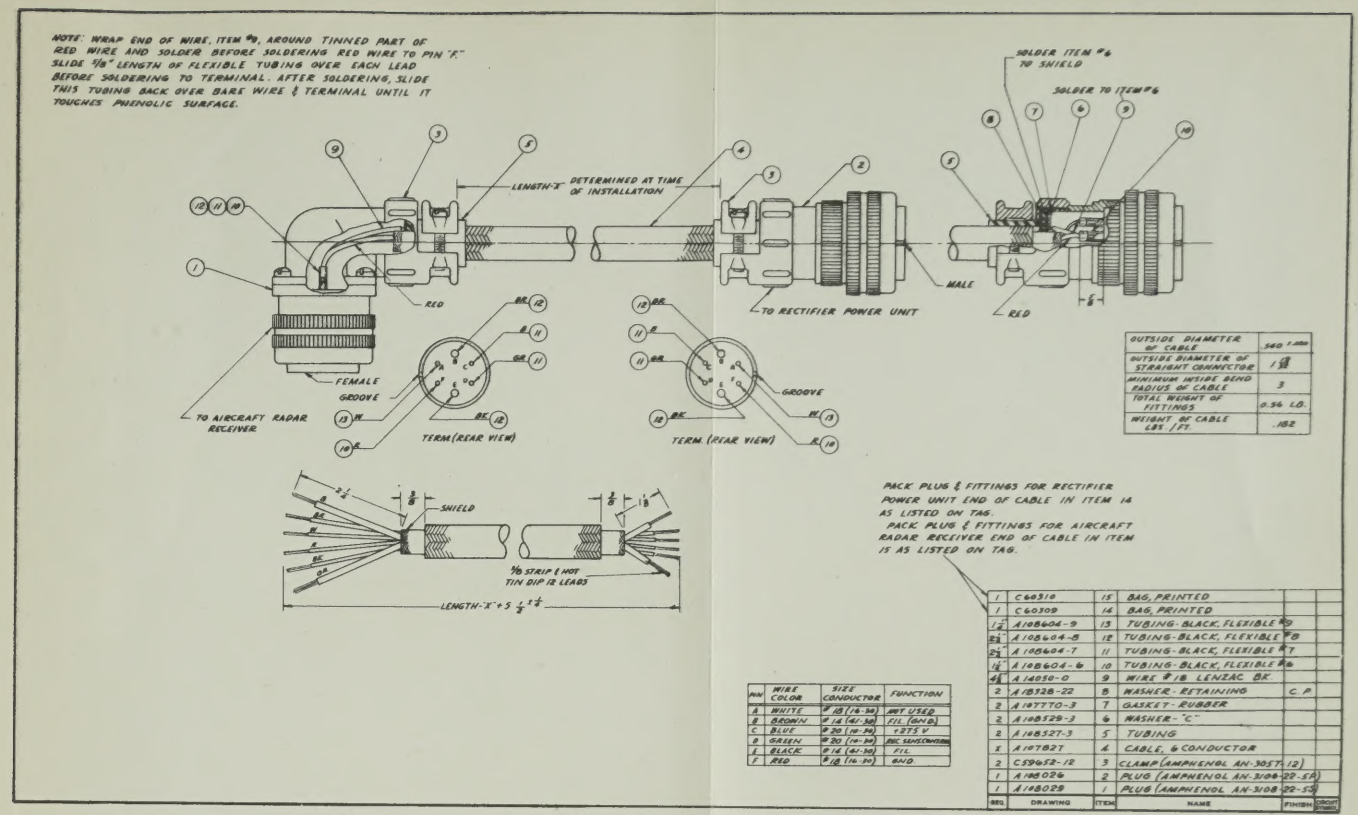

LENGTH "X" DETERMINED AT TIME OF INSTALLATION
SOLDER ITEM #6 TO SHIELD
MALE
TO ANTENNA SWITCHING UNIT
TO RECTIFIER POWER UNIT
FEMALE
GROOVE
TERM. (REAR VIEW)
NOTE: SLIDE 3/8" LENGTH OF FLEXIBLE TUBING OVER EACH LEAD BEFORE SOLDERING TO TERMINAL. AFTER SOLDERING, SLIDE THIS TUBING BACK OVER BARE WIRE & TERMINAL UNTIL IT TOUCHES PHENOLIC SURFACE.
PACK PLUG & FITTINGS FOR RECTIFIER POWER UNIT END OF CABLE IN ITEM 10 AS LISTED ON TAG.
PACK PLUG & FITTINGS FOR ANTENNA SWITCHING UNIT END OF CABLE IN ITEM 11 AS LISTED ON TAG.
SHIELD
1/8 STRIP & HOT TIN DIP & LEAD
LENGTH "X" + 4 3/4 ± 1/4

OUTSIDE DIAMETER OF CABLE	.395 ±.020
OUTSIDE DIAMETER OF STRAIGHT CONNECTOR	1 1/16
MINIMUM INSIDE BEND RADIUS OF CABLE	2
TOTAL WEIGHT OF FITTINGS	0.25 LB.
WEIGHT OF CABLE LBS/FT.	.079

PIN	WIRE COLOR	SIZE CONDUCTOR	FUNCTION
A	WHITE	#18 (16-30)	800 ~
B	RED	#18 (16-30)	800 ~

REQ.	DRAWING	ITEM	NAME	FINISH
1	C60308	11	BAG, PRINTED	
1	C60307	10	BAG, PRINTED	
1 1/2"	A108604-10	9	TUBING-BLACK, FLEXIBLE #10	
2	A18328-27	8	WASHER-RETAINING (CAD. PL.)	
2	A107770-1	7	GASKET-RUBBER	
2	A108529-1	6	WASHER-"C"	
2	A108527-1	5	TUBING	
X	A107825	4	CABLE, 2 CONDUCTOR	
2	C59652-8	3	CLAMP (AMPHENOL AN-3057-8	
1	A108014	2	PLUG (AMPHENOL AN-3106-16S-4P)	
1	A108017	1	PLUG (AMPHENOL AN-3108-16S-4S)	

FIGURE 12 — CABLE #4, ASSEMBLY DRAWING

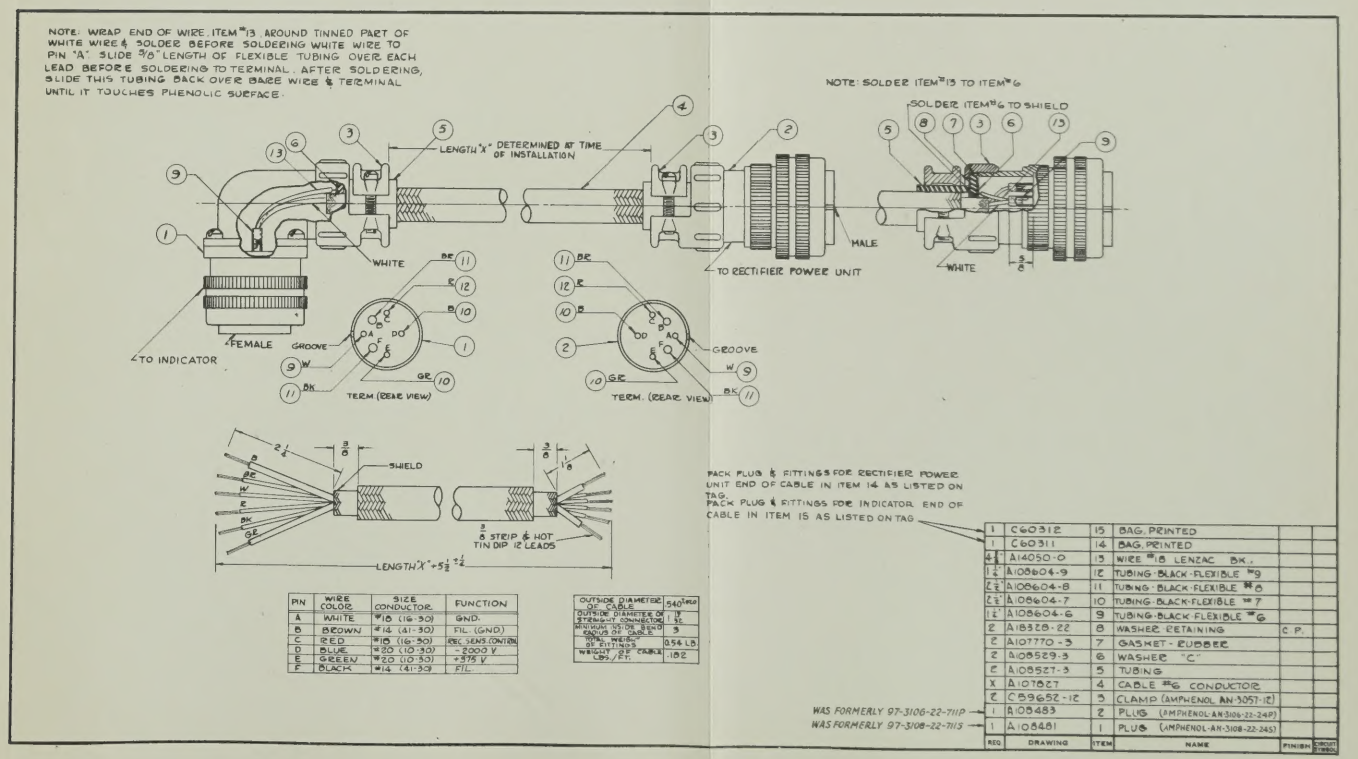

NOTE: WRAP END OF WIRE, ITEM #9, AROUND TINNED PART OF RED WIRE AND SOLDER BEFORE SOLDERING RED WIRE TO PIN "F". SLIDE 1/8" LENGTH OF FLEXIBLE TUBING OVER EACH LEAD BEFORE SOLDERING TO TERMINAL. AFTER SOLDERING, SLIDE THIS TUBING BACK OVER BARE WIRE & TERMINAL UNTIL IT TOUCHES PHENOLIC SURFACE.
LENGTH-X DETERMINED AT TIME OF INSTALLATION
SOLDER ITEM #6 TO SHIELD
SOLDER TO ITEM #6
MALE
TO RECTIFIER POWER UNIT
RED
FEMALE
GROOVE
TO AIRCRAFT RADAR RECEIVER
TERM (REAR VIEW)
SHIELD
1/8 STRIP & HOT TIN DIP 12 LEADS
LENGTH-X +5 1/2 +1/2
PACK PLUG & FITTINGS FOR RECTIFIER POWER UNIT END OF CABLE IN ITEM 14 AS LISTED ON TAG.
PACK PLUG & FITTINGS FOR AIRCRAFT RADAR RECEIVER END OF CABLE IN ITEM 15 AS LISTED ON TAG.

OUTSIDE DIAMETER OF CABLE	.340 +.010
OUTSIDE DIAMETER OF STRAIGHT CONNECTOR	1 1/16
MINIMUM INSIDE BEND RADIUS OF CABLE	3
TOTAL WEIGHT OF FITTINGS	0.36 LB.
WEIGHT OF CABLE LBS./FT.	.182

PIN	WIRE COLOR	SIZE CONDUCTOR	FUNCTION
A	WHITE	# 18 (16-30)	NOT USED
B	BROWN	# 16 (41-30)	FIL (GND)
C	BLUE	# 20 (10-34)	+275 V
D	GREEN	# 20 (10-34)	REC SENS CONTROL
E	BLACK	# 16 (41-30)	FIL
F	RED	# 18 (16-34)	B+

REQ.	DRAWING	ITEM	NAME	FINISH	CIRCUIT SYMBOL
1	C60310	15	BAG, PRINTED		
1	C60309	14	BAG, PRINTED		
1 1/2	A108604-9	13	TUBING-BLACK, FLEXIBLE #9		
2 1/2	A108604-8	12	TUBING-BLACK, FLEXIBLE #8		
2 1/2	A 108604-7	11	TUBING-BLACK, FLEXIBLE #7		
1 1/2	A108604-6	10	TUBING-BLACK, FLEXIBLE #6		
4 1/2	A 14050-0	9	WIRE #18 LENZAC BK.		
2	A 108328-22	8	WASHER-RETAINING	C.P.	
2	A 107770-3	7	GASKET-RUBBER		
2	A 108529-3	6	WASHER-"C"		
2	A 108527-3	5	TUBING		
X	A 107827	4	CABLE, 6 CONDUCTOR		
2	C59652-12	3	CLAMP (AMPHENOL AN-3057-12)		
1	A 108026	2	PLUG (AMPHENOL AN-3108-22-5A)		
1	A 108029	1	PLUG (AMPHENOL AN-3108-22-5S)		

FIGURE 13 — CABLE #5, ASSEMBLY DRAWING


NOTE: WRAP END OF WIRE, ITEM #13, AROUND TINNED PART OF WHITE WIRE & SOLDER BEFORE SOLDERING WHITE WIRE TO PIN "A". SLIDE 3/8" LENGTH OF FLEXIBLE TUBING OVER EACH LEAD BEFORE SOLDERING TO TERMINAL. AFTER SOLDERING, SLIDE THIS TUBING BACK OVER BARE WIRE & TERMINAL UNTIL IT TOUCHES PHENOLIC SURFACE.
NOTE: SOLDER ITEM #13 TO ITEM #6
SOLDER ITEM #13 TO SHIELD
LENGTH "X" DETERMINED AT TIME OF INSTALLATION
MALE
TO RECTIFIER POWER UNIT
WHITE
FEMALE
GROOVE
TO INDICATOR
TERM (REAR VIEW)
SHIELD
3/8 STRIP & HOT TIN DIP 12 LEADS
LENGTH "X" +5 1/2 +1/2
PACK PLUG & FITTINGS FOR RECTIFIER POWER UNIT END OF CABLE IN ITEM 14 AS LISTED ON TAG
PACK PLUG & FITTINGS FOR INDICATOR END OF CABLE IN ITEM 15 AS LISTED ON TAG
WAS FORMERLY 97-3106-22-11P
WAS FORMERLY 97-3108-22-11S

PIN	WIRE COLOR	SIZE CONDUCTOR	FUNCTION
A	WHITE	#18 (16-30)	GND.
B	BROWN	#16 (41-30)	FIL. (GND)
C	RED	#18 (16-30)	REC SENS. CONTROL
D	BLUE	#20 (10-30)	- 2000 V
E	GREEN	#20 (10-30)	+375 V
F	BLACK	#16 (41-30)	FIL.

OUTSIDE DIAMETER OF CABLE	.340 +.010
OUTSIDE DIAMETER OF STRAIGHT CONNECTOR	1"
MINIMUM INSIDE BEND RADIUS OF CABLE	3
TOTAL WEIGHT OF FITTINGS	0.54 LB
WEIGHT OF CABLE LBS./FT.	.182

REQ.	DRAWING	ITEM	NAME	FINISH	CIRCUIT SYMBOL
1	C60312	15	BAG, PRINTED		
1	C60311	14	BAG, PRINTED		
4 1/2	A14050-0	13	WIRE #18 LENZAC BK.		
1 1/2	A108604-9	12	TUBING-BLACK-FLEXIBLE #9		
2 1/2	A108604-8	11	TUBING-BLACK-FLEXIBLE #8		
2 1/2	A108604-7	10	TUBING-BLACK-FLEXIBLE #7		
1 1/2	A108604-6	9	TUBING-BLACK-FLEXIBLE #6		
2	A18328-22	8	WASHER RETAINING	C.P.	
2	A107770-3	7	GASKET-RUBBER		
2	A108529-3	6	WASHER "C"		
2	A108527-3	5	TUBING		
X	A107827	4	CABLE #6 CONDUCTOR		
2	C59652-12	3	CLAMP (AMPHENOL AN-3057-12)		
1	A108483	2	PLUG (AMPHENOL AN-3106-22-24P)		
1	A108481	1	PLUG (AMPHENOL AN-3108-22-24S)		

FIGURE 14 — CABLE #6, ASSEMBLY DRAWING

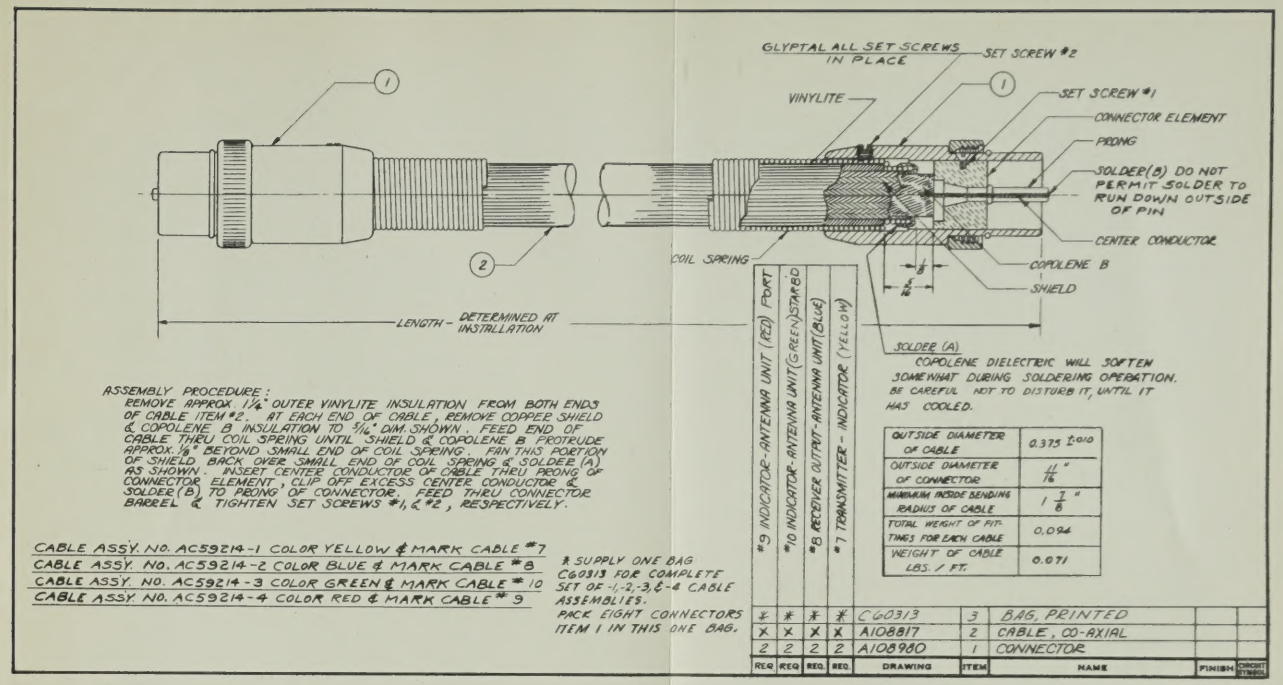

GLYPTAL ALL SET SCREWS IN PLACE
SET SCREW #2
SET SCREW #1
VINYLITE
CONNECTOR ELEMENT
PRONG
SOLDER(B) DO NOT PERMIT SOLDER TO RUN DOWN OUTSIDE OF PIN
CENTER CONDUCTOR
COPOLENE B
SHIELD
COIL SPRING
LENGTH - DETERMINED AT INSTALLATION
SOLDER (A)
COPOLENE DIELECTRIC WILL SOFTEN SOMEWHAT DURING SOLDERING OPERATION. BE CAREFUL NOT TO DISTURB IT, UNTIL IT HAS COOLED.
ASSEMBLY PROCEDURE:
REMOVE APPROX 1 1/2" OUTER VINYLITE INSULATION FROM BOTH ENDS OF CABLE ITEM #2. AT EACH END OF CABLE, REMOVE COPPER SHIELD & COPOLENE B INSULATION TO 5/16" DIM. SHOWN. FEED END OF CABLE THRU COIL SPRING UNTIL SHIELD & COPOLENE B PROTRUDE APPROX 1/8" BEYOND SMALL END OF COIL SPRING. FAN THIS PORTION OF SHIELD BACK OVER SMALL END OF COIL SPRING & SOLDER (A) AS SHOWN. INSERT CENTER CONDUCTOR OF CABLE THRU PRONG OF CONNECTOR ELEMENT, CLIP OFF EXCESS CENTER CONDUCTOR & SOLDER (B) TO PRONG OF CONNECTOR. FEED THRU CONNECTOR BARREL & TIGHTEN SET SCREWS #1, & #2, RESPECTIVELY.
CABLE ASSY. NO. AC59214-1 COLOR YELLOW & MARK CABLE #7
CABLE ASSY. NO. AC59214-2 COLOR BLUE & MARK CABLE #8
CABLE ASSY. NO. AC59214-3 COLOR GREEN & MARK CABLE #10
CABLE ASSY. NO. AC59214-4 COLOR RED & MARK CABLE #9
* SUPPLY ONE BAG C60313 FOR COMPLETE SET OF -1,-2,-3,&-4 CABLE ASSEMBLIES. PACK EIGHT CONNECTORS ITEM 1 IN THIS ONE BAG.
OUTSIDE DIAMETER OF CABLE 0.375 ±.010
OUTSIDE DIAMETER OF CONNECTOR 11/16"
MINIMUM INSIDE BENDING RADIUS OF CABLE 1 1/8"
TOTAL WEIGHT OF FITTINGS FOR EACH CABLE 0.094
WEIGHT OF CABLE LBS. / FT. 0.071
#9 INDICATOR-ANTENNA UNIT (RED) PORT
#10 INDICATOR-ANTENNA UNIT (GREEN) STARBD
#8 RECEIVER OUTPUT-ANTENNA UNIT (BLUE)
#7 TRANSMITTER-INDICATOR (YELLOW)
* * * * C60313 3 BAG, PRINTED
X X X X A108817 2 CABLE, CO-AXIAL
2 2 2 2 A108980 1 CONNECTOR
REQ REQ REQ REQ DRAWING ITEM NAME FINISH WEIGHT STOCK

FIGURE 15 — CABLES #7, #8, #9, AND #10, ASSEMBLY DRAWING

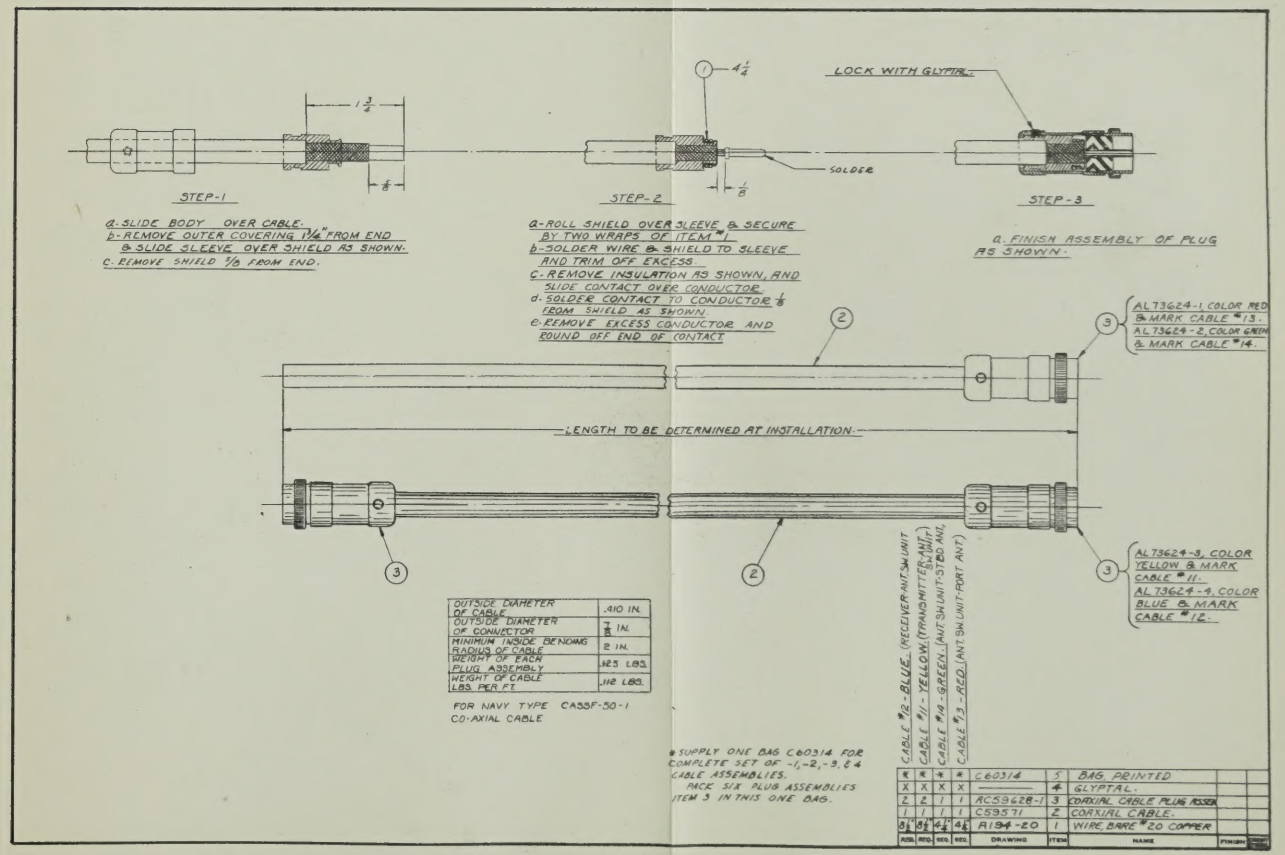
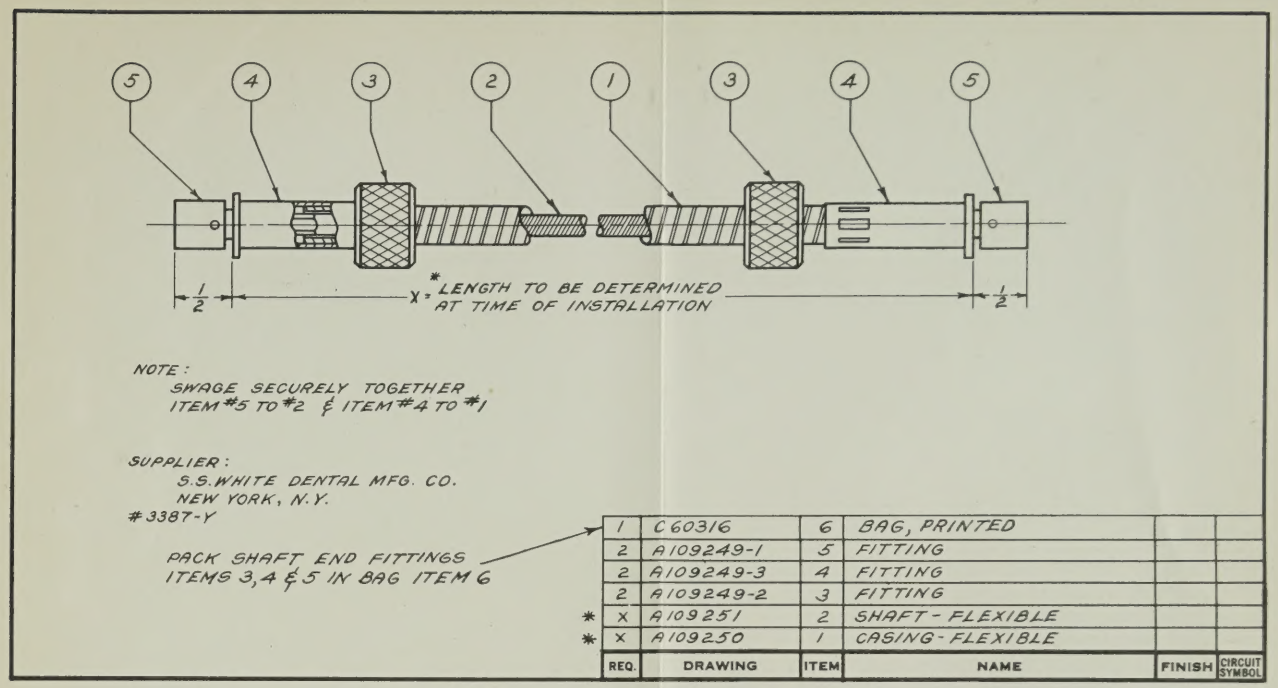

LOCK WITH GLYPTAL
SOLDER
STEP-1
a-SLIDE BODY OVER CABLE.
b-REMOVE OUTER COVERING 1 1/16" FROM END & SLIDE SLEEVE OVER SHIELD AS SHOWN.
c-REMOVE SHIELD 1/8 FROM END.
STEP-2
a-ROLL SHIELD OVER SLEEVE & SECURE BY TWO WRAPS OF ITEM #1.
b-SOLDER WIRE & SHIELD TO SLEEVE AND TRIM OFF EXCESS.
c-REMOVE INSULATION AS SHOWN, AND SLIDE CONTACT OVER CONDUCTOR.
d-SOLDER CONTACT TO CONDUCTOR 1/8 FROM SHIELD AS SHOWN.
e-REMOVE EXCESS CONDUCTOR AND ROUND OFF END OF CONTACT
STEP-3
a. FINISH ASSEMBLY OF PLUG AS SHOWN.
LENGTH TO BE DETERMINED AT INSTALLATION.
AL73624-1 COLOR RED & MARK CABLE #13.
AL73624-2, COLOR GREEN & MARK CABLE #14.
AL73624-3, COLOR YELLOW & MARK CABLE #11.
AL73624-4, COLOR BLUE & MARK CABLE #12.
OUTSIDE DIAMETER OF CABLE .410 IN.
OUTSIDE DIAMETER OF CONNECTOR 7/8 IN.
MINIMUM INSIDE BENDING RADIUS OF CABLE 2 IN.
WEIGHT OF EACH PLUG ASSEMBLY .123 LBS.
WEIGHT OF CABLE LBS. PER FT. .112 LBS.
FOR NAVY TYPE CA33F-50-1 CO-AXIAL CABLE
* SUPPLY ONE BAG C60314 FOR COMPLETE SET OF -1,-2,-3, & 4 CABLE ASSEMBLIES. PACK SIX PLUG ASSEMBLIES ITEM 3 IN THIS ONE BAG.
CABLE #12 - BLUE, (RECEIVER-ANT SW UNIT
CABLE #11 - YELLOW, (TRANSMITTER-ANT. SW UNIT
CABLE #14 - GREEN, (ANT SW UNIT-STBD ANT.
CABLE #13 - RED, (ANT SW UNIT-PORT ANT.)
* * * * C60314 1 BAG, PRINTED
X X X X — 4 GLYPTAL.
2 2 1 1 AC59628-1 3 COAXIAL CABLE PLUG ASSEM
1 1 1 1 C59571 2 COAXIAL CABLE.
6" 6" 4" 4" A194-20 1 WIRE, BARE #20 COPPER
REQ REQ REQ REQ DRAWING ITEM NAME FINISH WEIGHT STOCK

FIGURE 16 — CABLES #11, #12, #13, AND #14, ASSEMBLY DRAWING



	REQ.	DRAWING	ITEM	NAME	FINISH	CIRCUIT SYMBOL
	1	C60316	6	BAG, PRINTED		
	2	A109249-1	5	FITTING		
	2	A109249-3	4	FITTING		
	2	A109249-2	3	FITTING		
*	X	A109251	2	SHAFT - FLEXIBLE		
*	X	A109250	1	CASING - FLEXIBLE		

FIGURE 17 — FLEXIBLE TUNING SHAFT, ASSEMBLY DRAWING

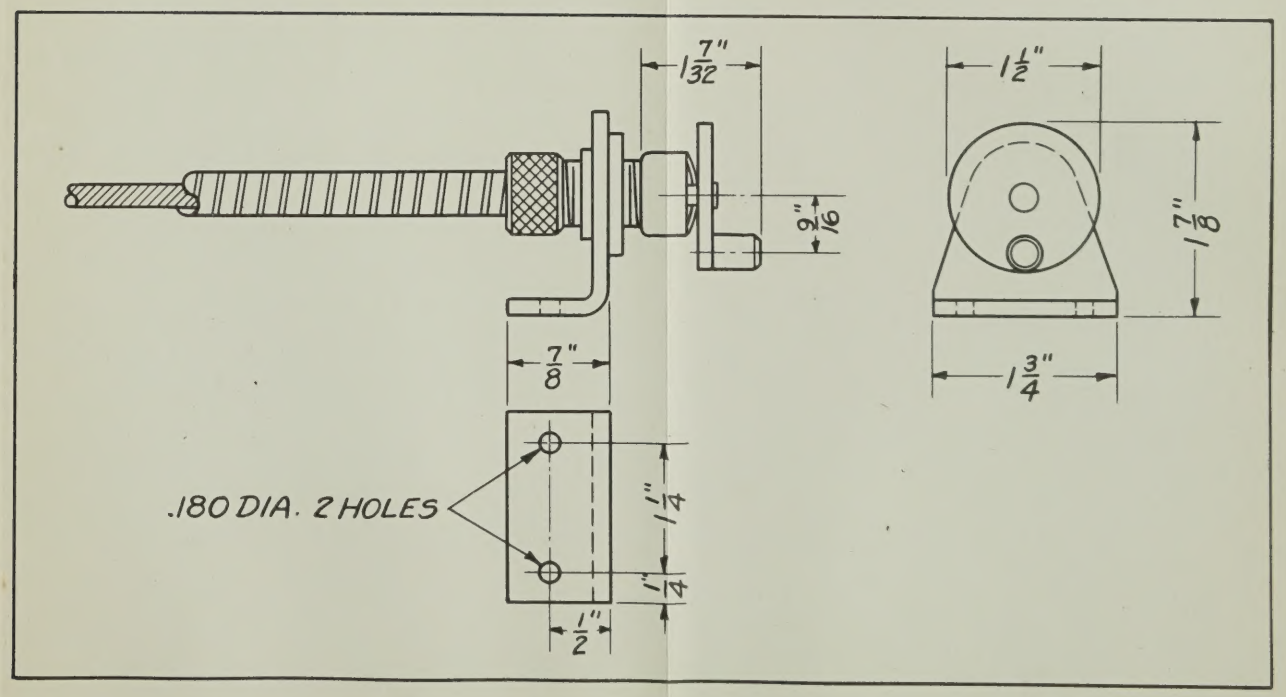


FIGURE 18 — COMPLETE REMOTE TUNING CONTROL, OUTLINE AND MOUNTING DIMENSIONS

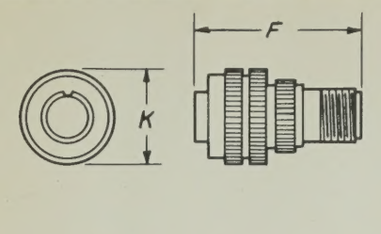


FIGURE A

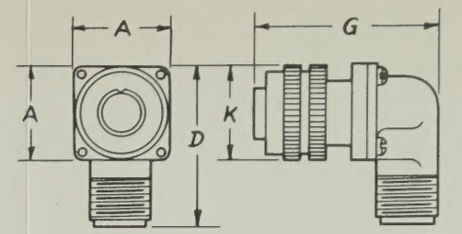


FIGURE B

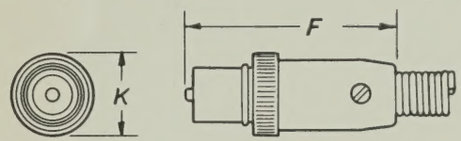


FIGURE C

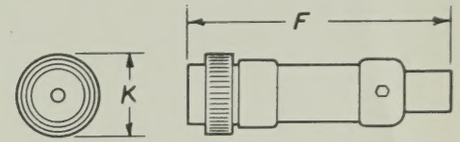


FIGURE D

CABLE NUMBER	CABLE CONNECTION	CONNECTOR		FIGURE	DIMENSIONS IN INCHES				
		AMPHENOL NUMBER	BENDIX NUMBER		A	D	F	G	K
1	POWER SUPPLY	NOT SUPPLIED							
	POWER CONTROL UNIT	AN-3106-22-5S	A108027	A			$2\frac{1}{8}$		$1\frac{19}{32}$
2	POWER CONTROL UNIT	97-3106-22-5P	A108484	A			$2\frac{1}{8}$		$1\frac{19}{32}$
	RECTIFIER POWER UNIT	97-3106-22-5S	A108482	A			$2\frac{1}{8}$		$1\frac{19}{32}$
3	RECTIFIER POWER UNIT	AN-3106-20-4P	A108020	A			$2\frac{1}{8}$		$1\frac{15}{32}$
	AIRCRAFT RADAR TRANSMITTER	AN-3108-20-4S	A108023	B	$1\frac{5}{8}$	$2\frac{1}{16}$		*3	$1\frac{15}{32}$
4	RECTIFIER POWER UNIT	AN-3106-16S-4P	A108014	A			$1\frac{7}{16}$		$1\frac{3}{16}$
	ANTENNA SWITCHING UNIT	AN-3108-16S-4S	A108017	B	$1\frac{5}{16}$	$1\frac{3}{4}$		*$2\frac{11}{32}$	$1\frac{3}{16}$
5	RECTIFIER POWER UNIT	AN-3106-22-5P	A108026	A			$2\frac{1}{8}$		$1\frac{19}{32}$
	AIRCRAFT RADAR RECEIVER	AN-3108-22-5S	A108029	B	$1\frac{5}{8}$	$2\frac{1}{8}$		*3	$1\frac{19}{32}$
6	RECTIFIER POWER UNIT**	AN-3106-22-24P	A108483	A			$2\frac{1}{8}$		$1\frac{19}{32}$
	INDICATOR ‡	AN-3108-22-24S	A108481	B	$1\frac{5}{8}$	$2\frac{1}{8}$		$2\frac{15}{16}$	$1\frac{19}{32}$
7	AIRCRAFT RADAR TRANSMITTER	80-81	A108980	C			$1\frac{3}{8}$		$\frac{11}{16}$
	INDICATOR	80-81	A108980	C			$1\frac{3}{8}$		$\frac{11}{16}$
8	ANTENNA SWITCHING UNIT	80-81	A108980	C			$1\frac{3}{8}$		$\frac{11}{16}$
	AIRCRAFT RADAR RECEIVER	80-81	A108980	C			$1\frac{3}{8}$		$\frac{11}{16}$
9	ANTENNA SWITCHING UNIT	80-81	A108980	C			$1\frac{3}{8}$		$\frac{11}{16}$
	INDICATOR	80-81	A108980	C			$1\frac{3}{8}$		$\frac{11}{16}$
10	ANTENNA SWITCHING UNIT	80-81	A108980	C			$1\frac{3}{8}$		$\frac{11}{16}$
	INDICATOR	80-81	A108980	C			$1\frac{3}{8}$		$\frac{11}{16}$
11	ANTENNA SWITCHING UNIT	93M (MODIFIED)	AC59628-1	D			$\frac{7}{8}$		$2\frac{17}{32}$
	AIRCRAFT RADAR TRANSMITTER	93M (MODIFIED)	AC59628-1	D			$\frac{7}{8}$		$2\frac{17}{32}$
12	ANTENNA SWITCHING UNIT	93M (MODIFIED)	AC59628-1	D			$\frac{7}{8}$		$2\frac{17}{32}$
	AIRCRAFT RADAR RECEIVER	93M (MODIFIED)	AC59628-1	D			$\frac{7}{8}$		$2\frac{17}{32}$
13	ANTENNA SWITCHING UNIT	93M (MODIFIED)	AC59628-1	D			$\frac{7}{8}$		$2\frac{17}{32}$
	PORT ANTENNA	NOT SUPPLIED							
14	ANTENNA SWITCHING UNIT	93M (MODIFIED)	AC59628-1	D			$\frac{7}{8}$		$2\frac{17}{32}$
	STARBOARD ANTENNA	NOT SUPPLIED							

**WAS FORMERLY 97-3106-22-7111P ‡ WAS FORMERLY 97-3108-22-7111S * MAXIMUM DIMENSION

FIGURE 19 — CABLE CONNECTORS, OUTLINE DIMENSIONS